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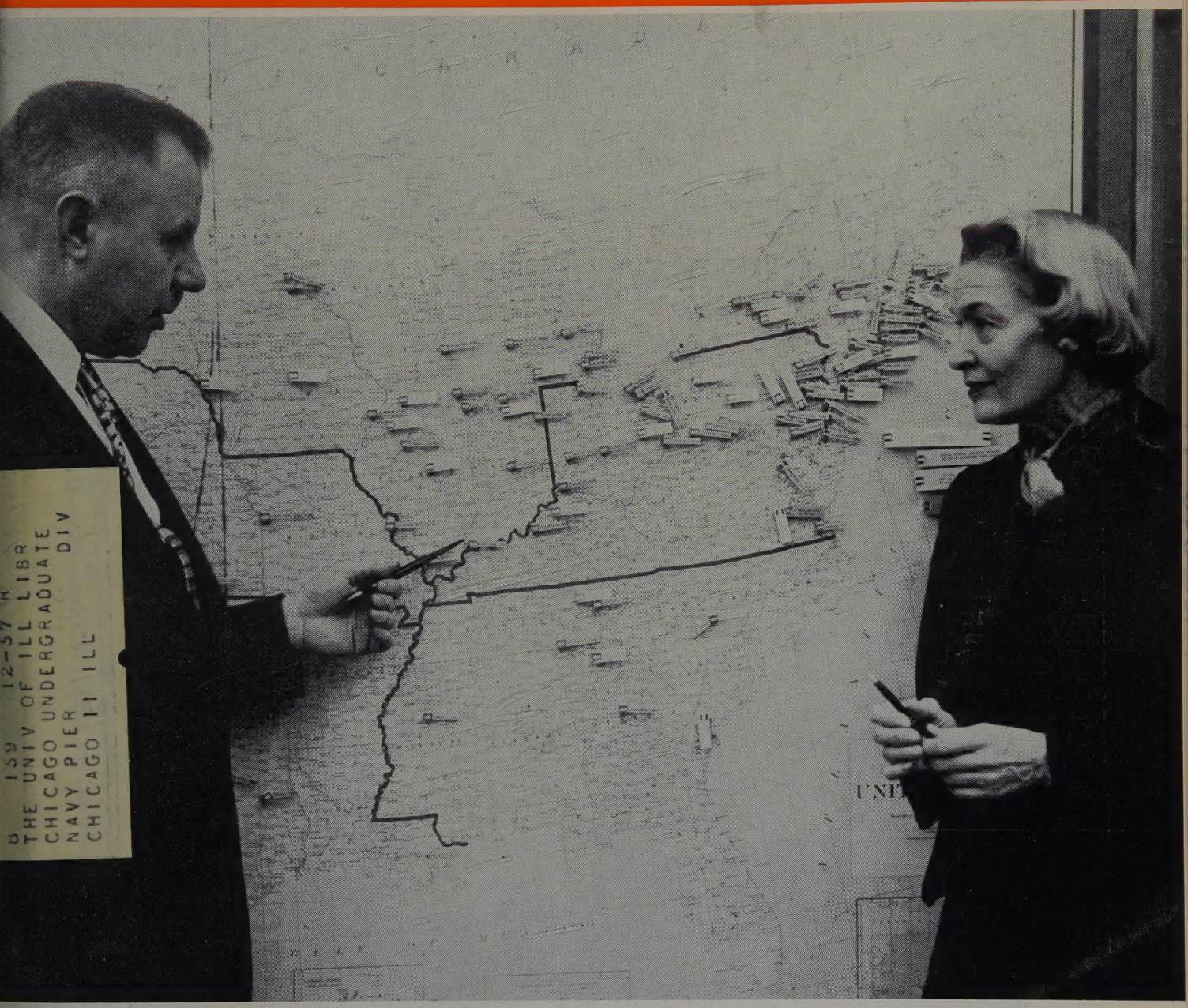
JULY 1957

# Skyways FOR BUSINESS

NATIONAL BUSINESS AIRCRAFT ASSOCIATION OFFICIAL PUBLICATION



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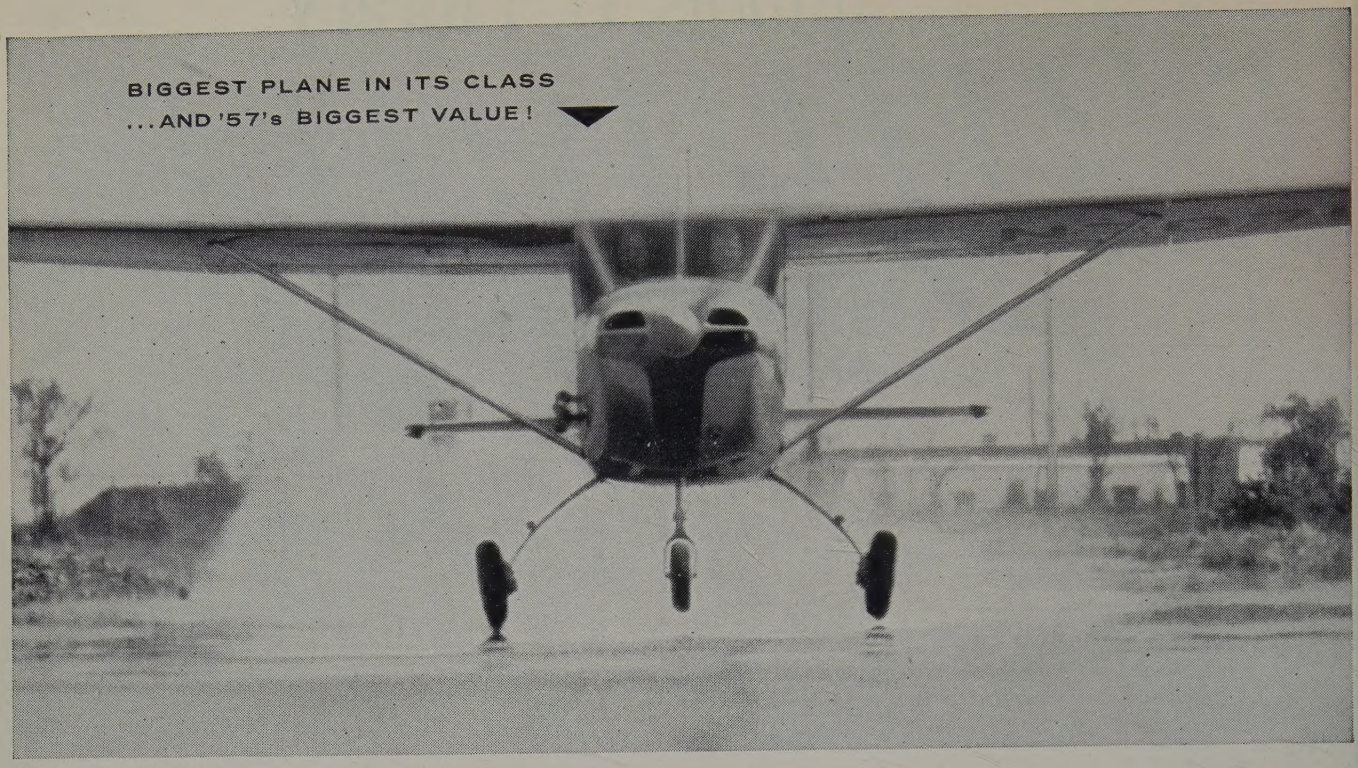
FOR THE SAFETY OF OUR NATION—see page 16

- Heads in the Clouds
- Policy for Air Space
- Round Table: Complacency in the Cockpit




# BEST ALL-ROUND STABILITY IN ITS CLASS!

## ...with Land-O-Matic* landing gear...tapered high wing... 57 other exclusive features in the big new '57 Cessna 172

*the feature that's revolutionizing flying.

More and more pilots are proving it: the big Cessna 172 is easier, more stable and comfortable to fly... does have dozens of extra features not found in any other low-priced plane! That's why it quickly became the largest-selling airplane!

From its smooth 145-H.P. 6-cylinder Continental engine, world record holder for endurance flight... through its larger, more-handsomely appointed cabin... to its Land-O-Matic landing gear that shrugs off shocks from short, rough landings and take-offs... here is an airplane so far ahead of its class you must see and fly it yourself to fully appreciate its value! And a Cessna 172 (with std. equip.) is priced at just $8,975... f.a.f. Wichita.

So get proof—in flight today from your nearby Cessna dealer (Yellow Pages of phone book) or write: CESSNA AIRCRAFT CO., DEPT. S-9, Wichita, Kans.

**Inquire about Cessna lease plans**

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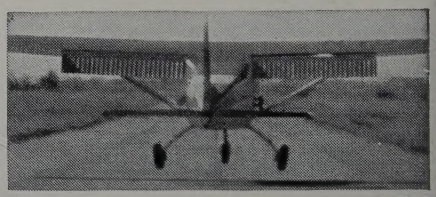
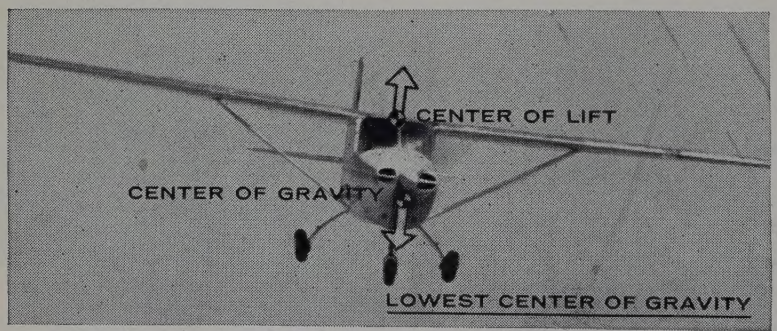
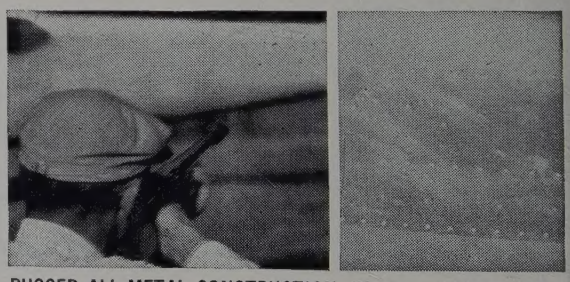


MOST FLAP IN ITS CLASS! Cessna's 120%-larger Para-Lift flaps give shorter take-off runs, slower and smoother approaches, actually float you down twice as gently as a man in a parachute. And they're exclusive to the Cessna 172 in the low-priced field.

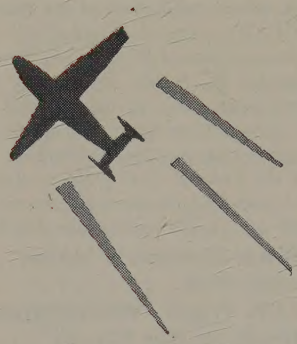



TRUE HIGH-WING STABILITY with a bigger, high-lift wing and a lower center of gravity than any other plane in the low-priced field! You do less trimming, compensating in flight—enjoy a "big-plane feel."



RUGGED ALL-METAL CONSTRUCTION. It's even shotgun-tough, as shown in these unretouched photos! Stays just as tough after years of service! And the Cessna 172 is the only all-metal airplane priced so low. Inside, too, you find quality through and through—newly designed luxury interiors for '57, far more baggage capacity, and the fullest windshield visibility in its class.

4 GREAT CESSNAS 172 180 182 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED



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*Esso is there . . . at 600 airports!* Nowadays, flying's a breeze! One reason: Esso Aviation Dealers. No doubt about it, they're really tops for A-1 service (and those Esso fuels and lubricants are A-1 too!). If you've got an Esso Aviation Credit Card, it's even better . . . you can charge tire and battery service, landing fees, overnight in-transit storage and minor emergency repairs as well as your gasoline, oil and lubrication. Next flight . . . enjoy yourself! Put down where there's an Esso Aviation Dealer.

FREE TO PILOTS! See your nearest Esso Aviation Dealer for a free Flight Sequence Card, containing everything from VHF frequencies for private pilots to traffic control light signals.

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JULY, 1957

# Skyways FOR BUSINESS

**The official publication of the National Business Aircraft Association**

*COVER: General Wendell H. Duplantis, Assistant Administrator, Operations Control Services, Federal Civil Defense Administration, and Mrs. Frances W. Nolde, Director of the General Aviation Div., Defense Air Transport Administration, stand before a national stockpiling map: that is, a map showing the locations of stockpiles of emergency medical and engineering supplies throughout the nation. These supplies are controlled by the Federal Civil Defense Administration, and will play a vital role in the event of enemy-created emergencies in the U. S. The NEDA Plan will aid in the immediate distribution of these supplies, if need arises.*

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# now hear this . . .

**C. Donald McLain** is new Research and Development Manager of Western Brass Mills div. of Olin Mathieson Chemical Corp. At the same time, he'll continue as chief metallurgist.

**John R. Campbell** has been appointed Regional Sales Manager for Philco's Govt. & Industrial Division for Western Regional area (offices in L.A. and Seattle).

Bell Helicopter Corp. announces the following additions and changes: **Turpin Gerard** is new test pilot at the Fort Worth plant; **J. Harry Orpen** is new commercial salesman in the Central sales area; **Charles T. Strachan** is new salesman for Eastern and Northern states; **Robert Lynn** has been promoted to chief experimental project engineer; replacing Lynn as project engineer for Bell HSL-1 tandem-rotor anti-submarine helicopter, is **Mike Kawa.**

**Leroy W. Collins** is now personnel manager of the Mechatrol Div. of Servomechanisms, Inc., Westbury, N.Y. Collins was formerly personnel mgr. with Intl. Latex Corp., and is a Lieut. in the USAFR.

**W. R. Miller,** formerly vp of mfg. for Longren Aircraft Co., has opened his own firm, Miller Associates, in Los Angeles. The concern specializes as management consultants in industrial, electronic and technical executive procurement.

**Don VanChantfort** has been named director of advertising and publicity by Taylorcraft, Inc. He was previously with a number of newspapers and ad agencies.

**Stanley W. Koenig** has been promoted to Director of Advertising for Olin Mathieson Chemical Corp.

**Wm. S. Clark,** of Temco Aircraft Corp., has been elected nat'l. chairman of Aircraft Industries Assoc.'s Nat'l. Aircraft Standards Committee. Regional NASC chairmen and vice-chairmen are: **George W. Field,** of Sikorsky Aircraft, and **Samuel L. Feldberg** of the Martin Co., in the eastern div., **James O. Archer,** of Lockheed, and **F. Preston Spalding,** of North American Aviation, Inc., in the western region.

**Rodney D. Chipp** is the new Manager of Systems Engineering for the Radio Communication Laboratory of Federal Telecommunication Laboratories, Nutley, N.J.

**Dr. Russell R. Law** has joined Hughes Aircraft Co. as Director of New Product Development for Hughes Product Group.

**C. D. Oberg** has been named Director of Sales for Solar Aircraft Co., of San Diego, Calif., and Des Moines, Ia. Oberg has been with Solar for 18 years.

**W. B. Paine** is new exec. vp of Bendix-Westinghouse Automative Air Brake Co. **I. F. Richardson** replaces Paine as general mgr. of Kansas City div. of Bendix Aviation, and **Eldred E. Evans** is assistant gen. mgr. there.

**James V. Lecocq** is public relations mgr. for Milwaukee plants of AC Spark Plug Div. of General Motors.

**Charles J. Moxley** has been appointed Staff Counsel for Flight Refueling, Inc., and **James J. Cannon, Jr.,** is now Contracts Administrator for the firm.

**Stanley B. Smith** is the new Sales Mgr. of Aircraft Engine Equip. at Bendix Products Div. of Bendix Aviation, South Bend, Indiana.

**Edward F. Jones,** asst. to the pres. of Convair div. of General Dynamics Corp., has been elected natl. chairman of the Public Relations Advisory Committee of the Aircraft Industries Association.

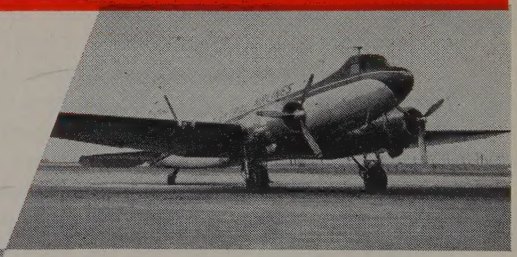
**Henry Eagle, Jr.** is the new exec. vp of Omega Aircraft Corp., New Bedford, Mass. He will also serve as advisory test pilot. He was formerly vp and Ops Mgr. for Cleveland Air Taxi, Inc.

**James R. Kerr** is the new president of Lycoming div. of Avco Mfg. Corp. He was formerly Director of Office of Defense Planning for Avco, and mgr. of Advanced Devel. Div.

**Jimmy Mattern,** president of Calif. wing of OX-5 Club, reports that over 700 members are now on the roster, and still more are expected to join in the future.


Congratulations...

TRANS-TEXAS AIRWAYS
Estimated October, 1947 through June, 1957
Passengers Flown . . . 1,026,853
Passenger Miles Flown 234,846,042



SOUTHERN AIRWAYS, INC.
Estimated June, 1949 through May, 1957
Passengers Flown . . . . . 957,266
Passenger Miles Flown 163,178,501

CENTRAL AIRLINES, INC.
Estimated September, 1949 through June, 1957
Passengers Flown . . . 455,941
Passenger Miles Flown 74,468,000

Dallas Aero Service, engine overhaul agency for Central Airlines, Southern Airways and Trans-Texas Airways, is proud to salute these three airlines on their many accomplishments and achievements as outstanding local service airlines. Congratulations on a job well done and best wishes for continued success.

DALLAS AERO SERVICE

3300 LOVE FIELD DRIVE • PHONE FL 2-2641 • DALLAS 19, TEXAS

COMPLETE ONE-STOP SERVICE ON CONVENIENT LOVE FIELD

# Apache "PERFORMANCE IS TOPS— IN EVERY CATEGORY."

*Donald D. Randall (right), president, and Dale Hyatt, company representative in Texas, Oklahoma and Kansas, board the Fender Sales Apache.*

"Our company did a great deal of looking and questioning before purchasing a Piper Apache last January," says Donald D. Randall, president of Fender Sales, Inc., Santa Ana, California. "We can truthfully say that the performance of the airplane far exceeds any expectations we had.

"We owned four single engine airplanes before buying the Apache, and we find that the twin engine airplane has greatly improved our utility. There are many times when it is possible to make a controlled VFR climb-out and progress on top for many miles, which wouldn't be good practice with a single engine. Believe me, the secure feeling one has in being on top for an hour or two is vastly different from what we used to experience. It also allows more direct routes to our destinations."

Fender Sales, Inc., a wholesale musical instrument distribution firm, serves accounts throughout the United States, Canada, Alaska and Hawaii.

"Our Apache is used in many different ways, calling on dealers and distributors and carrying rush cargo," says Mr. Randall. "Frequently we ferry dealers from Los Angeles International to our own Orange County Airport, a long and arduous trip by car due to the distance and extremely heavy traffic, but a scenic 20-minute trip by Apache.

"We are greatly pleased with the Apache's speed and find it very economical to operate. In sum, we think the Apache's performance is tops—in every category."

**Consider the advantages of the PIPER Apache**

**It's the world's largest selling, multi-engine executive transport Four- or five-passenger capacity. 170 mph cruising speed. Up to 1,200-mile range. Powered by two 150 hp Lycomings. For full information see your Piper dealer or write for catalog, Dept. K-7.**

**MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD**

**PIPER AIRCRAFT CORPORATION**

**LOCK HAVEN, PENNSYLVANIA**

# Editorial

## GENERAL AVIATION

The *General Aviation Facilities Planning Group*, assisting Mr. Edward P. Curtis in analyzing America's aviation needs, did not put on rose colored glasses to project the future growth of general aviation.

Instead of creating a possible optical illusion which tinted glasses might have produced, this group got out their slide rules and surveyed the hinterlands to come up with facts and figures necessary to establish engineering projections.

It is no surprise to aviation's most constructive advocates that the present number of 65,000 planes used by general aviation (which excludes the military and the airlines) will increase to 90,000 by 1976. Nor is it any surprise that peak week-day takeoffs and landings will increase from the present 380,000 to 558,000 over the same period of time. Already forty-five per cent (45%) of all landings and takeoffs handled by CAA towers are made by general aviation aircraft. That percentage of all such airport activity has in the past few years shown steady increase.

The surge in the growth of general aviation in recent years has come largely from the increased use of aircraft by American business. Granting that normal ups and downs in industrial economy may not produce year to year consistency in this continued growth, it nevertheless seems that the ever growing need to decentralize American business will demand greater and greater dependance upon airplanes. Only the business airplane can offset the losses that otherwise accrue from slow communications.

A net gain of 25,000 airplanes in general aviation in twenty years is an average gain of only 1250 such airplanes per year. American business fleets alone should generate that many without considering the growth that will also come from other segments of general aviation.

## WATCH THE COMPASS HEADING

Seldom has a voice been heard in official Washington on the subject of aviation in response to which all segments of a great industry should unanimously say, "Amen."

The recent voice of Edward P. Curtis deserves that benediction.

Mr. Curtis' recommendation of a powerful *Federal Aviation Agency* that would absorb CAA, take over CAB's regulatory and investigative powers, abolish numerous complex, red tape committees, and, once and for all, fix final authority and responsibility for aviation in a single agency, comes as a rainbow in a turbulent sky.

Gratifying as this recommendation may be, it is nevertheless regretted that General Curtis did not seem to think it wise nor prudent to fix a target date earlier than 1960 for the establishment of FAA.

It is to be hoped that the proposed interim *Airways Modernization Board* will work conscientiously to breathe mortal life into the long needed FAA before 1960. Human nature being what it is, it could be that the Airways Modernization Board will not do so. Washington Boards seem to have a rather consistent history of working for self-perpetuation. Therefore, AMB should be closely followed by the watchful eye of the aviation industry. If AMB does not steadfastly work to facilitate and bring FAA into being, then the whole of the aviation industry should rise and let itself be heard in righteous indignation.

Mr. Curtis' counsel for evolutionary accomplishment (orderly transition) may be right, and best, but the need is so great for a single agency to control the airspace and all regulations pertaining thereto that we dare to hope and pray that the Secretaries of Commerce and Defense and the Congress of the United States will constantly watch the heading of the interim AMB compass. They must insist that this Board, which they will obviously control, keeps its original heading, *divests* itself, and gets on to the target terminal—Federal Aviation Agency.

# NBAA . . . Director's Notes

● First business flying weather service to offer enroute weather advisories by radio is scheduled for first operations this month.

Headed by Capt. Harry Van Liew, veteran airline and Marine Corps pilot, the National Weather Forecasting Corporation will be based at NBAA Member Newark Air Service's hangar at Newark Airport.

Details for business aircraft frequencies, which will be used to up-date pre-flight weather briefings given by telephone, have been cleared, Capt. Van Liew states.

Long-experienced flight forecasters and meteorologists head the technical staff.

● Airways Modernization Board bill, endorsed before the House and Senate Interstate and Foreign Commerce committees by NBAA, has received support (some of it qualified) from all segments of aviation: Department of Defense—representing Army, Navy, Air Force; Air Transport Association—for the airlines; Aircraft Owners and Pilots Association—for general aviation. All were, for a remarkable change, all recorded as generally favoring the bill.

● It will not be until the next Congressional session that the Curtis report will be resolved into legislation proposing a Federal Aviation Agency.

● Aerial hitch-hiking is the latest game played along the airways.

Faced with trying to go through a sky full of black cauliflower, the non-radar equipped aircraft keeps a sharp listening and looking watch for the boys with the black nose. Then, it's "follow the leader" through the towering CBs—providing the radar equipped ship will cooperate on a mutual voice frequency.

Russian Roulette is safer; only involves one person's life.

● All the proposed Florida legislative bill said was that it "would remove aircraft from being classed as motor vehicles."

What it didn't say would have filled a book as far as aircraft owners in Florida were concerned.

Motor vehicles are exempt from personal property taxes . . . can be licensed only by the state . . . and the bill would have also allowed new taxes on aviation gas.

NBAA members in Florida, notified by National Headquarters, rallied with other aviation interests to clobber the bill.

● Bill introduced before Congress in June would provide funds for flight testing Stratoport runway project. If flight-tests prove the theory, the number of runways now in use at airports could be reduced through the use of the wind-break fence envisioned by Stratoport.

*WRY REMARKS:*

The approach controller was working some twenty or thirty assorted aircraft. The weather was up-and-down, visibility came and went.

"What's the latest terminal weather?" cried Number 17 in the stack.

"Two hundred and three-quarters," responded the overburdened controller, "and, a solid aluminum overcast."

A mid-air collision *could* spoil your whole day.

The two-way stretch doesn't always refer to a glidepath.

# Suite 344

Your Board of Directors held the May Board Meeting in Denver, Colorado, on Monday, May 6. Those present—Joseph B. Burns, President of NBAA, representing The Fuller Brush Company; Henry W. Boggess, representing Sinclair Refining Company; James Ketner, Jr., representing Texas Eastern Transmission Corporation; Ralph E. Piper, representing Monsanto Chemical Company; Robert Sprague, Jr., representing Sprague Electric Company. John Winant, Sprague Electric Company; "Dutch" Barbettini, Southwest Airmotive Company; Leonard Abbey, Sinclair Refining Company and Paul Vander Ploeg, International Harvester Company, were welcome guests of the Board.

Congratulations to Robert C. Sprague, Jr., Sprague Electric Company and NBAA Board Member. Bob has been awarded a Sloan Fellowship for a year's study at Massachusetts Institute of Technology as a candidate for a Master of Science Degree.

On behalf of the membership, NBAA welcomes three new Regular Members accepted by the Executive Committee: Gardner Advertising Company, St. Louis, Missouri, Advertising Agency, operating a Cessna 310. William J. Rogers, Vice President, is NBAA representative and Everett J. Taylor is Chief Pilot. Dayton Newspapers, Inc., Dayton, Ohio, Publishing, Radio and Television, operating a Model 18 Learstar. Ralph W. Smith is NBAA representative and Chief Pilot. W. W. Windle Company, Millbury, Massachusetts, Wool Manufacturers, operating a Cessna 310. Winfred W. Windle, President, is NBAA representative and Robert H. Swenson is Chief Pilot.

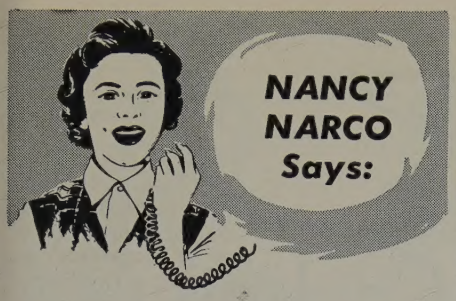
*Mailings for the month of May*—Curtis Report on Aviation Facilities; Background Memorandum on the Future of General Aviation; Weather Bureau Telephone Numbers for Aviation Service; Forms for revision of Directory of Business Aircraft; Priority Wires on Airworthiness Directives to all NBAA users of Bell 47 Helicopters, Aero Commanders, Cessna 310, Curtiss-Wright C-46, Piper PA-22 and PA-23s.

K. H. Skinner, Vice President, Sales, Jeppesen & Co. has announced the June 1 opening of offices and plant of Jeppesen & Co., Gmbh, in Frankfurt, Germany, and the publication of a European Edition of the Jeppesen Airway Manual.

Harry Wallingford and Jim Ketner, Texas Eastern Transmission Co.; Jim Herrick, Cessna Aircraft Company; George Dutton, L. B. Smith Aircraft Corporation; Henry J. Schiebel, Jr., Grumman Aircraft Engineering Corp.; Norman Wolberg, Dallas Airmotive Co.; Edwin Fund and Richard Peck, Texas Gas Transmission, were visitors of National Headquarters last month.

Ed Rice, Manager, Commercial JATO Sales, Aerojet-General Corporation, represented NBAA at the National Summer Meeting of the Institute of the Aeronautical Sciences. Bill Lear, Lear, Inc., was Chairman of the session on Business Aircraft.

Bill Lawton attended the one-day Air Traffic Control Symposium sponsored by the Minnesota Business Aircraft Association, in cooperation with ALPA, ATCA, CAA, MILITARY, State Aeronautics Dept. He enjoyed the very fine meeting and is convinced that NBAA, under the leadership of Jim Magnus, Minneapolis-Honeywell Regulator Co., is doing an excellent job of cementing good (*Continued on page* 35)




HAD A SERIOUS TALK with a bunch of senior-type control tower operators the other day. It started when I asked them what was the greatest single problem in their work. To my surprise—it was the little matter of receiver tuning.

THE MAN IN THE TOWER has a lot of facilities at his disposal, but they're not worth a thing when the little man who calls him for landing instructions doesn't have his receiver tuned to the right frequency. Usually, this guy calls and calls; he may get sore that the tower is apparently ignoring him. He may suspect that his transmitter isn't putting out, so he starts blowing and whistling and banging at his defenseless little mike. "Why," my tower friends ask, "don't they just tune their receivers to our frequency?"

LOTS OF REASONS WHY—all pretty silly. Out-of-date charts may show the wrong tower frequency—or, more likely, it's a case of improper tuning. So many people fail to allow for small tuning errors which are unavoidable in tunable receivers. Best thing is to tune to the tower while he's talking to someone else a few minutes before you have to call. If not, "rock" your tuning dial immediately after calling the tower until you hear him replying.

INCIDENTALLY, it would sure help if the tower boys would say their identification more frequently. Often you tune what you think is the tower you want only to find it's some other tower on an adjacent frequency.

OF COURSE, you people with crystal-controlled receivers have no problem. And the "whistle stop" introduced by Narco for positive crystal-calibrated tuning has made life simpler for thousands of Simplexer and Omnigator Mark II owners.

SOME DAY NARCO will catch up with its back orders on the new Omnigator Mark II, with "whistle stop" and all. Then you'll have yours, and you won't have to worry.

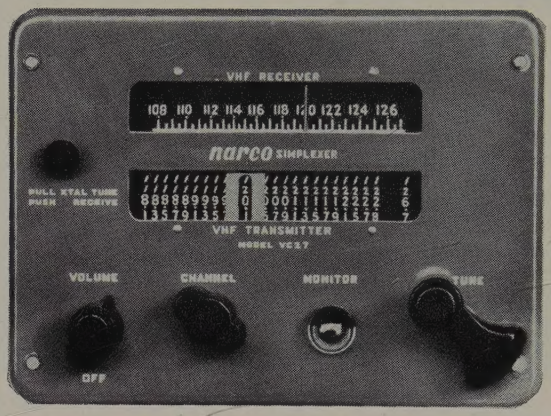
Regards,

Nancy

**NARCO • Fort Washington, Pa.**

# Need more frequencies?

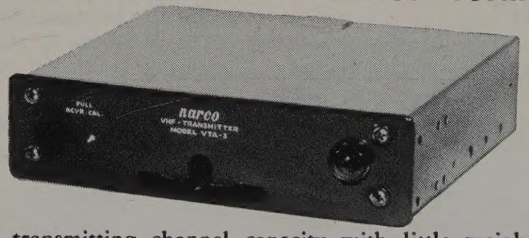
## . . . FOR BETTER TOWER, EN ROUTE AND DIRECT CENTER COMMUNICATIONS




## Add the narco SIMPLEXER 27 CHANNEL VHF TRANSCEIVER

The Narco 27-channel Simplexer is business aviation's most popular communications transceiver. With its broad-band transmitter (118 to 126.7 mc) the Simplexer accommodates 27 crystals covering every channel needed for normal IFR operations. "Whistle-stop" feature gives quick, crystal-calibrated tuning for simplex transmission with center, tower or ATCS. Compact size permits convenient installation. Thousands of Simplexers are in daily use. Just the answer for that extra communications unit you need while working VOR or ILS.

## AND NOW! narco VTA-3 27 CHANNEL TRANSMITTER WITH "WHISTLE-STOP" TUNING FEATURE




Now, multiply transmitting channel capacity with little weight penalty and lowest cost with the new Narco VTA-3, 27-channel VHF transmitter. VTA-3 can be used with own power supply as independent unit or in conjunction with Narco Omnigator or Simplexer. Available in low-band version (118 to 123 mc) or high-band version (121.5 to 126.7 mc).

"Whistle-stop" feature provides positive, crystal-calibrated tuning of any VHF receiver in the airplane.

**You'll enjoy the convenience of the extra 27 channels provided by either the Simplexer or VTA-3. Bring your communications up to date with one or both of these fine Narco units. See your Narco dealer or write for brochure.**

**narco**

**NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PENNSYLVANIA**

SKYWAYS FLIGHT OPERATIONS ROUND TABLE

# Complacency in the Cockpit

*Panelists discuss the factors leading to pilot complacency, the dangers resulting from this overconfidence, and the many ways to prevent its occurrence.*

- "I very strongly recommend the use of some kind of challenge-response system in conjunction with the checklist."
- "The more familiar we become with our aircraft and our routes, the more complacent we tend to become."
- "Practicing various procedures when the opportunity presents itself is a good way to avoid the dangers of complacency."
- "The twin-engine aircraft most people are familiar with are very easy to fly, and complacency in the cockpit is really a problem."
- "An accident at Idlewild a few years ago was entirely the result of pilot fatigue."
- "Lack of sleep is very dulling to your ability to concentrate. Instrument flight becomes much more difficult."
- "No accident is ever the result of just one single incident, but rather the cumulative effect of several things which go wrong, which get beyond the pilot's ability to handle them."
- "An anonymous system of reporting these incidents would be very valuable to executive pilots."
- "Companies can help their pilots to avoid errors made through complacency by advising them, as long before the flight as possible, of the destination, all enroute stops and the number of passengers."
- "Flight planning is a strict necessity for the conduct of a safe flight."
- "It would be very foolish to skip any points on the checklist."
- "The mechanical use of the checklist is an example of complacency."
- "The pilot who goes below minimums because he is in a hurry to get home is sticking his neck out a mile."
- "Sitting in an airport can be just as fatiguing as flying."

*AN EXECUTIVE PILOT evaluation program is explained by Jim Leckie (center) to Elton Stone, Doug Garneau, Kent Davis and Frank Emenegger (l. to r.) Leckie flies as an observer with executive pilots and evaluates their flying. Later, he reviews with the pilots the accredited, standardized operation in terms of route and equipment.*

**Charles Banfe, Moderator** *(PAA):* "It seems that the greater the number of flying hours we build up, the better we know our aircraft and the routes over which we fly, the more serious the problem of complacency in the cockpit becomes. Kent Davis of CAA will lead off our discussion."

**Davis** *(CAA):* "Complacency is defined in the dictionary as a feeling of quiet pleasure or satisfaction. Complacency in the cockpit can lead one into a dangerous situation, possibly with fatal consequences. If you have been on IFR clearances in CAVU weather with the autopilot working while you are reading the latest football results and your co-pilot is working out weight and balance forms and navigating, you know how little time it takes for another aircraft to get within the collision-danger zone. At the fast speeds of modern aircraft, the relative speed becomes fantastic, and it will become even more so when more jets are in the air.

"Complacency shows up in many different ways. When you see cumulus clouds in a beautiful formation you may be tempted to go through the top portion without stopping to think that someone on the other side may be doing the same thing at the same time. When you begin to let down, does it occur to you that some of your passengers may be asleep, or have colds, which may make for uncomfortable air pressure? A complacent pilot wouldn't think of that. How do you handle a 'Fasten Seat Belt' sign in smooth IFR weather? Do you leave it on all the time, or just when the first sign of turbulence appears?

"We realize that once you obtain your instrument rating, the regulations do not require periodic checks, but do you just sit back and say, 'I have it made'? Have you made any effort to learn pilot's shorthand for copying clearances, or do you trust to memory and the possibility of finding out, too late, that you're at the wrong altitude? These are all examples of complacency or self-satisfaction."

**Banfe:** "*What you say shows that complacency isn't always caused by the boredom of sitting in a cockpit with*

*PANELISTS at the* SKYWAYS *Round Table on "Complacency in the Cockpit": (standing, left to right) Chuck Banfe, Skyways; Kent Davis, CAA; Charles Holcomb, U.S. Plywood; Frank Emenegger, Fairhurst Lumber; Jim Leckie, CAA. Seated, (l. to r) George Scott, Oakland Airmotive; Hal Keefe, Mannix Ltd; Elton Stone, Bechtel, and Doug Garneau, Utah Construction Co.*

*nothing to do. Many times we cause it ourselves.*

*"Doug Garneau has something to say about filing flight plans."*

**Garneau** *(Utah Construction Co.):* "Companies can help their pilots to avoid errors of complacency by advising them, as long before the flight as possible, of all pertinent data. Pilots can then gauge gas load, file a flight plan with CAA, and keep a flight log, with a listing of all headings, range frequencies and mileage between stations, much like an airline flight log.

"This way, there would be only one piece of paper to look at in the cockpit. Looking at maps and charts, and refiling while in the air, cause traffic dangers, particularly with traffic the way it is today."

**Banfe:** *"How do you feel about that, Hal Keefe? Do all Canadian executive pilots have complete and comprehensive flight plans?"*

**Keefe:** "I think we do. However we're getting into a problem here of who is going to monitor the flight plan, to make sure that everything is correct as to mileages, headings and checkpoints. Sometimes I have given that responsibility to my co-pilot, and sometimes I have had to change it in the air. The flight plan is important, and it has to be right."

**Banfe:** *"Jim Leckie, you're instrumental in trying to initiate a new program of flight evaluations and route checks rather than local instrument checks for executive pilots. When you have been on some of these route evaluations, what did you find to be the case?"*

**Leckie** *(CAA):* "It's only fair to give the pilot as much advance information as possible before starting on a flight, because the pilot is responsible for seeing that all the necessary manuals and charts are there, and that all of the preflight planning is conducted properly.

"I would like to go back to an experience I had on an airline, to demonstrate what happens when crews are not properly briefed before starting a flight. I flew with a crew from San Francisco to Seattle deadhead for a trip to Honolulu. We were on course about an hour out of Seattle, which was an unfamiliar base for this crew, when we realized that we didn't have the proper aeronautical manuals to complete the flight. We had to divert back to San Francisco, pick up the manuals and start the flight again.

"It makes a pilot's job much easier if he runs into all his problems while doing his pre-flight planning on the ground."

**Banfe:** *"Then you agree that preflight planning has a lot to do with eliminating complacency in the cockpit."*

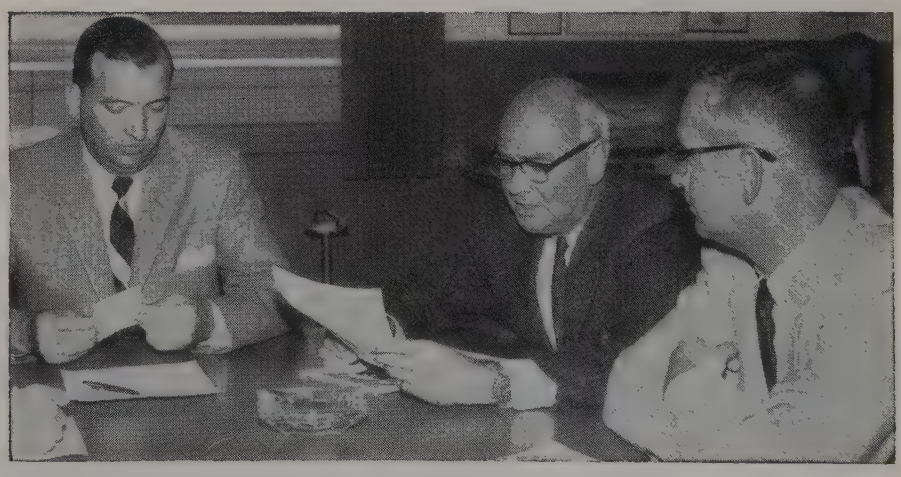
**Leckie:** "Flight planning is a strict necessity for the conduct of a safe flight."

**Banfe:** *"George Scott, what do you think of checklists? As we get to know our aircraft, there is always the temptation of running over the checklist, or skipping a few items."*

**Scott** *(Bay Aviation Service):* "It would be very foolish to skip any points on the checklist. Before take-off, a very thorough examination should be held on the aircraft, and in the event that any part does not check out properly, the plane should be returned to the flight line to be repaired before the flight is started."

**Banfe:** *"Elton Stone, may we hear your opinion of proficiency checks for eliminating complacency in the cockpit?"*

**Stone** *(Bechtel Corp.):* "We have adopted a training program which is very similar to that of the airlines, in using not only company checks but also



*"DO YOU ASK FOR A (PERIODIC) CHECK on your own, or do you just sit back and say 'I have it made'?" asks Kent Davis (center) of CAA, in speaking of pilot complacency. Listening closely are Jim Leckie, of CAA, and Frank Emenegger, Fairhurst Lumber Co.*

## ROUND TABLE PARTICIPANTS

*CHUCK BANFE, Moderator, is a Captain with PAA, now flies the Tokyo route. He was formerly on the staff of Esquire Magazine, and foreign editor of Aviation News. He has some 16,000 hours logged; was a civilian instructor in the RCAF and was in the RAF Eagle Squadron. He's flown the Atlantic 300 times.*

*KENT G. DAVIS, Supervising Inspector for CAA, was a Naval aviator before World War II. He began work with CAA in 1939, interrupted it to serve with the Naval Air Transport Service during the war, and then returned to his CAA duties.*

*FRANK EMENEGGER is Chief Pilot with the Fairhurst Lumber Co. He's been a commercial pilot since 1936, and was a fixed-base operator until World War II. He spent four years with the USAF Air Training Command and has been a corporation pilot for the past seven years.*

*DOUGLAS GARNEAU is Chief Pilot for the Utah Construction Co. He served in a Naval Air Transport Squadron in the Alaska-Aleutian area, and then spent some time with various scheduled and non-sched airlines. He's been in his present position for 3 years.*

*CHARLES F. HOLCOMB, Chief Pilot for U.S. Plywood Corp., spent 3½ years with the USAF, and has been associated with business flying on the West Coast since 1946.*

*HAL KEEFE, Chief Pilot for Mannix, Ltd. since 1947, served throughout World War II as a flight instructor in the RCAF. In 1955 and 1956, he was Chairman of the Corporate Aircraft Committee of the Air Industries and Transport Association of Canada.*

*JAMES A. LECKIE, Aviation Safety Agent for CAA, is the CO of a Marine Jet Fighter Reserve Squadron. He received his flight training with the Navy and served in the Marines during World War II. Afterwards, he was Operations Manager and pilot for Transair, Inc. in New York. He joined CAA in 1948.*

*GEORGE W. SCOTT is Sales Manager for Bay Aviation Services of San Francisco. He flies Cessna 310's and DC-3's.*

*ELTON C. STONE, Captain Pilot for the Bechtel Corp., was an instrument flight instructor from 1938 to 1942. He spent the ensuing years, until 1953, as pilot and Captain with Pan Am, Flying Tiger and North American Airlines.*

6-month proficiency checks with the CAA. Whenever we request it, and they can possibly squeeze us in, Mr. Davis and Mr. Leckie give us a standard 6-month proficiency check, not only for the aircraft but for our instrument flying ability."

**Banfe:** *"How long is the CAA test and what areas does it cover?"*

**Davis:** "The 6-month hood check and the check we give on the ground usually take about an hour and a half. In that time we usually try to give them an ADF approach, an ILS approach and a low frequency approach, with numerous changes from Victor airways to low frequency airways. We have several procedures worked up for departures out of the Bay Area which, in a fast airplane, keep them pretty busy."

**Leckie:** "On the matter of checklists, I don't think that anyone who flies will dispute the necessity for using a checklist on any aircraft that is at all complicated.

"However, I believe the *mechanical* use of the checklist is an example of complacency. I once permitted a man to take off in a DC-3 with the oil shutters closed. I brought his attention to it when the oil temperature got into the red-line area. He did not realize that he had failed to check them.

"I would very strongly recommend the use of some kind of challenge-response system in conjunction with the checklist, so that the control is being touched, or some other positive action is taken to assure that the item is being checked. I have seen some individuals run through a checklist in a matter of 15 seconds, although there may be 15 or 20 items on the list. Instead of answering with the response which is indicated on the checklist, they simply say, 'Okay, okay, okay.' By watching their hands and eyes, I can tell that they are not really checking each item.

"An exceptional example of complacency in the cockpit occurred when a Constellation with a pilot, co-pilot and engineer in the cockpit took off on empty tanks. They lost #2 and #4 engines; the engineer switched on the emergency reserve, which gave them fuel on their #1 and #3 engines, but in another 10 or 15 seconds they would have lost all 4 engines. They had a checklist, where they had been challenged as to whether the fuel was in the proper tank, and the response was made that it was, nevertheless they were on empty tanks for take-off. I think that's a real indication that there is a tendency to be mechanical in the use of the checklist; that's why I'm so sure a challenge-response routine in the use of the checklist would be so valuable."

**Banfe:** "Most of the airlines use that. Cappy Hayes of CAT told me that when he is in command, every time he asks about an item he touches that item and thinks of its function. By thinking of its function, he knows that he has put it in its proper position. Capt. Hayes has flown some 10,000 hours on C-46's between Taipei and Tokyo, and he is convinced that the more he flies, the more important a checklist is, and the more important vigilance is. He feels, as I'm sure we all do, that the more familiar we become with our aircraft and our routes, the more complacent we tend to become."

**Emenegger** *(Fairhurst Lumber Co.):* "Practicing various procedures when the opportunity presents itself is a good way to avoid the danger of complacency. In our operation most of our flying is between Seattle and San Diego. Frequently we make approaches into places like Portland, where you can have a radar controlled approach. If you combine that with an ILS you can get some pretty good practice. In other places, like Arcata and Eugene, where they have considerable fog, we're strictly ILS, and we will frequently get someone who's familiar with the area, a local pilot, and put our hood in and have him shoot some approaches with us."

**Banfe:** *"Chuck Holcomb, what do you do about emergency procedures?"*

**Holcomb** *(U. S. Plywood Corp.):* "We have a company policy whereby we try to simulate an engine out or engine failure at least once in every 10 hours. It was originally in our operations manual. We've combined it into a training program.

"The twin-engine aircraft that most people are familiar with are very easy to fly, and complacency in the cockpit is really a problem, especially in a business operation where there's only one pilot. In this case the success of the flight depends on just one person. Complacency is brought about by ease of flying, by repetitive actions, and you soon get the impression that everything is fine and that you can easily take care of an engine out or a hydraulic failure. Ten hours is not too frequent to repeat an emergency procedure, because when something does happen the pilot must be able to do it quickly and proficiently, particularly if there's only one man to do it."

**Banfe:** *"George Scott mentioned something about difference between manufacturers in switches and flaps and gear handles."*

**Scott:** "Some of the switches and levers are worked on a reverse basis. In operation for demonstration purposes, our procedure is to use the checklist very thoroughly, going through everything in proper order. In the event that we let the customer do it, then another pilot or I would automatically follow him through each procedure, and touch

*(Continued on page 42)*

# HEADS in the CLOUDS

by Charles V. Mathis

*A TYPICAL AIRCRAFT used for photogrammetry is this A-11 Twin-Beech, operated by Jack Ammann of San Antonio, Tex. Note special plastic nose for increased pilot visibility. Plane used depends on project: for example, a P-61 is used for high-altitude work.*

A group of men with their heads in the clouds are garnering down-to-earth profits from a fast-growing business: aerial surveys. They're practitioners of a relatively new art—photogrammetry.

As defined by the American Society of Photogrammetry, photogrammetry is the science of obtaining reliable measurements by photography. It's the technique of producing maps and drawings by shooting photographs of the earth's surface from airplanes.

In principle, the task sounds fairly simple. A high-flying plane takes stereoscopic (three dimensional) pictures which produce a view of the ground similiar to what could be seen by an imaginary giant with eyes two miles apart.

In practice, making maps and drawings from these stereo-photos with contour intervals scaled from one foot to perhaps 50 feet apart, calls for complex equipment. Only in the past decade has the business grown to sizable proportions. Photogrammetrists say that's largely because newer equipment—faster, less cumbersome and less costly than older varieties—has come on to the market. Businessmen can now afford aerial mapping, and they've found it often costs much less than traditional ground surveying.

Today, over two dozen aerial mapping concerns are operating across the nation. Scores of other companies including such well-known names as Eastman Kodak, Ansco, Du Pont and Bausch & Lomb, to name a few, supply equipment, cameras, film or technical advice to aid them.

"Why, if George Washington wanted to start as a surveyor in 1956, he'd get a camera and learn to fly," says one aerial photographic specialist.

In these days of short-handed engineering staffs an aerial mapping program has been a source of relief to many municipalities. Besides their role in plotting maps of various kinds, aerial surveys are used in scores of ways: To locate highways, pipe lines, power lines, sewers or levees; to study water flow, stream erosion or river courses; to zone cities and plan new shopping centers, mining, river and harbor developments; to locate sites for industrial plants, and spot railroad spurs or dam sites and stock pile inventories.

Photogrammetry solves two of the roadbuilder's most pressing problems: How to get more for the construction dollar and how to manage a vastly enlarged road program with limited engineering manpower.

With photogrammetry, previously unobtainable breadth of terrain is placed before the highway engineer. A large-scale topographic map is compiled at a cost comparable with the amount formerly spent for one or two narrow ground-survey lines. A new special electronic computer, attached to a precise airmapping instrument, actually tabulates position and height of ground points visible in aerial photographs. Skilled draftsmen trace features and details according to rigid specifications, and in the process, all available sources of information are used. Every sheet is carefully checked in detail by an experienced editor, to assure complete accuracy. After editing, the maps are then ready for processing and reproduction to their final printed form.

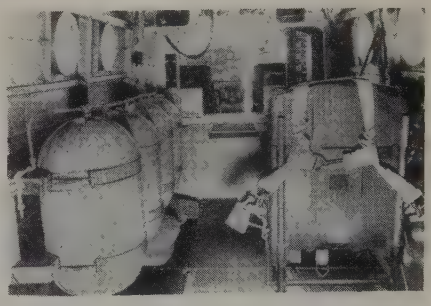
Instead of trudging back and forth over miles of ground in his search for the most economical new highway route the engineer sits in his office with his map before him. Quickly he traces a number of possible route lines. The map tells him the shape and height of hills, and it shows the locations of man-made works like railroads, bridges, factories and houses. Thus he can test each line for the steepness of its grades, the sharpness of its curves and the extent of its effect on real property.

Savings as high as 20% in earthwork volume can be expected in rugged terrain when both electronic computing and aerial maps are used for highway location and design.

The construction cost of new divided highways today is in the $500,000 to $1,000,000 a mile range. Earthwork costs, therefore, are $150,000 to $300,000 a mile on the average, so a $30,000 to $60,000 earthwork saving is possible in every mile. This over-all saving, a result of better engineering, exceeds the location and design cost of a new highway; it is ten to fifteen times the cost of maps used in the engineering.

In addition to the production of

*(Continued on page 38)*



*INTERIOR of photogrammetry plane shows oxygen tanks. Crews breathe 100% oxygen when working above 25,000-foot altitude.*

*HIGH-ALTITUDE photography is shown here. Photographer sees the ground on the negative-size, ground-glass view finder.*

# Business Aircraft and Civil Defense Readiness

*By Francis W. Nolde*

The National Emergency Defense Airlift (NEDA) plan is a vital factor in the nation's Civil Defense organization. It is:

- a fleet of some 800 business and private aircraft of 12,500 lb. and over, comprising a voluntary supplement of Federal Civil Defense transportation.
- critically valuable for the transportation of medical and engineering supplies to emergency areas.
- a joint development of the Defense Air Transportation Administration of the Dept. of Commerce, and the Federal Civil Defense Administration.

*April issue of Skyways described the voluntary civil defense NEDA Plan. This story tells how it provides an auxiliary arm for the nation's defense.*

In the event of an attack on the U.S. all aircraft may initially be grounded under the SCATER Plan (Security Control of Air Traffic and Electromagnetic Radiation). (The SCATER Plan, applicable to all U.S. areas, provides a means by which the Air Defense Command may control friendly air traffic as necessary to perform its mission.) Aircraft will be required to land promptly at the nearest suitable airport, or as directed by Air Traffic Control. NEDA pilots will then report to the office of the Airport Manager of any airline station airport, giving identity, type of aircraft and state of readiness.

Requests for use of NEDA aircraft will normally originate from Federal or Regional levels of the Civil Defense establishment, and will be channelled through State Civil Defense Headquarters to the various Airport Managers' offices.

State Aviation Directors have been requested by Civil Defense to appoint local NEDA Coordinators to serve with each Airport Manager. These Coordinators will act as liaison with the state Civil Defense authorities, securing information from them as to Civil Defense requirements and dispatching NEDA aircraft as necessary to meet those requirements.

Gen. Wendell H. Duplantis, USMC (Ret), Federal Civil Defense Asst. Administrator for Operational Control Services: "Through fiscal 1957, approximately $212-million have been appropriated by Congress for stockpiling medical supplies for the purpose of saving lives and caring for casualties which may result from enemy-created emergencies in the U.S. It is hoped that Congressional appropriation will continue in future years to add to these life-saving medical materials.

*Gen. Wendell H. Duplantis*

"Of these supplies, 149-million dollars' worth have already been delivered to FCDA control at 42 stockpile locations strategically positioned throughout the U.S. In addition, certain small units of emergency medical supplies are located in Hawaii, Puerto Rico, and Alaska. FCDA also has pre-positioned a total of 91 Civil Defense emergency hospitals throughout the U.S. and has an additional 46 hospitals on loan to various states for training purposes.

"All of these various stockpile locations are carefully positioned in relation to transportation systems. Highway, rail or air transportation is readily available for emergency use at each location, and many sites are especially convenient to air facilities. That fact, plus the small average sizes and weights of much of the individual units of medical supplies and equipment, make transportation by NEDA especially appropriate in emergency operations."

Congressional interest in NEDA planning is evidenced by the statements of 2 U.S. Senate leaders, as well as an outstanding Congressman:

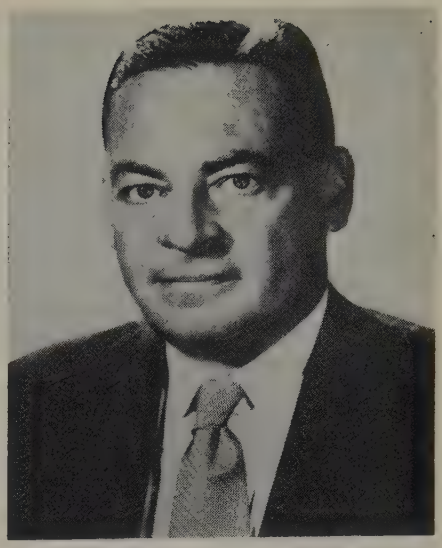
Senator Irving M. Ives, of New

*IN CONFERENCE about latest phases of NEDA Plan activity are (left to right): Col. A. B. McMullen, Executive Director of the National Assoc. of State Aviation Officials; Hon. Bradley D. Nash, Deputy Under Secretary of Commerce for Transportation; and Hon. Theo. Hardeen, Jr., Administrator of Def. Air Transp. Admin.*

*TYPICAL OF NEDA AIRCRAFT is this Convair 340, bearing the specially-designed NEDA decal in red, white and blue.*

*Sen. Irving M. Ives*

*Hon. Frances P. Bolton*



*Sen. Thomas C. Hennings, Jr.*

York: "It is gratifying to know that an integral part of this country's defense readiness program stems from the voluntary cooperation of owners of business aircraft in placing at the disposal of Federal Civil Defense some 800 multi-engine planes for use in disaster areas under mobilization conditions. The National Emergency Defense Airlift constitutes a vast auxiliary fleet presently in being at no cost to the taxpayer but immediately available for a war-supporting mission. This affords an example of far-sighted planning between government and industry."

Hon. Frances P. Bolton, Ohio: "The NEDA program as developed by the Defense Air Transportation Admin. and Federal Civil Defense, represents an unusual example of cooperative planning in the field of mobilization. By volunteering this great potential airlift, the owners and pilots of NEDA aircraft will provide a most important and effective system of moving critical materials from the numerous stockpile locations throughout the continental U.S. to stricken areas where many lives can thus be saved.

"To those of us who are somewhat familiar with the potential service the helicopter can render, it is particularly interesting that Val Peterson, FCDA Administrator, is an expert helicopter pilot, which probably contributes to the recent increase in company-owned helicopters. As one citizen, I am happy to express my appreciation of this fast developing NEDA."

Senator Thomas C. Hennings, Jr., of Missouri: "In reviewing the National Emergency Defense Airlift Plan for the use of business and private aircraft in support of Federal Civil Defense under mobilization, I am greatly impressed with its importance as a means of immediate transportation of doctors, nurses, and medical and engineering supplies to stricken areas. To this end, the NEDA plan can provide a service of inestimable value to the nation."

**GOV.** *Val Peterson (seated) discusses the role of helicopters in emergency situations with Bill Lawton (L), Exec. Dir. and Sec. of NBAA; Theodore Hardeen, Jr., Admin., Def. Air Transport. Admin., Dept. of Commerce; and Mrs. Frances Nolde, Dir. of Gen. Aviation., Def. Air Transport Adm. NBAA has about 400 members representing over 10000 single- and multi-engine business planes. Of the 800 aircraft over 12,500 lbs. needed by NEDA, many will be provided by NBAA.*

# NAVICOM

## Winds Aloft: Observations or Forecasts?

Because of complaints by pilots that winds aloft encountered in flight differed widely from those indicated by available wind observations, the Weather Bureau has for several years been issuing detailed forecasts of winds aloft. Although the forecast service eliminates most of the problems arising from obsolete observation reports, many pilots still have questions about it.

Pilots' complaints about the difference between winds aloft reports and the actual conditions were justified largely because observations cannot be made more frequently than once in 6 hrs. It takes about 2 hrs. to compute the results of balloon soundings and to send the information over the weather teletype circuits. This means that in almost all cases wind information is at least 2 hrs. old when it reaches the pilot. As much as 8 hrs. can elapse before another observation report is available; on the average, reports are 5 hrs. behind actual conditions. Sometimes, low clouds or high surface winds in a given area may prevent observations and hence the issuance of any reports covering that area.

At the altitudes most often used by general aviation, winds aloft can change very rapidly, by as much as 180°, for example, because of the passage of a cold front. Sometimes wind speed decreases markedly a few hours after a cold front passes. Generally, winds aloft increase and change direction at the approach of a major storm system. When the storm has passed they tend to decrease and to change direction again. Especially in these cases, winds aloft observations a few hours old no longer indicate true conditions.

Winds aloft *forecasts*, which are for 12-hr. periods, are issued every 6 hrs. for almost 150 spot locations comprising a national network. Speeds and directions are stated for specific levels, usually 3-, 6-, 10-, 15- and 20,000′. Winds for intermediate levels can be judged by considering a uniform change in direction and speed between adjacent levels. For example, if the wind for 3000′ is expected to be 15 knots and, for 6000′, 30 knots, the winds for 4000′ and 5000′ may be expected to be 20 and 25 knots respectively. The same procedure is used to determine expected wind direction for intermediate levels. For each significant change expected in wind direction and speed, the forecaster states the new values and the times the changes are expected to occur. If no significant change is expected, the forecast wind would be essentially the same as the last observed wind.

Winds aloft forecasts, while stated for spot locations, also apply to the average winds in an area around the station. Aside from occasional "busts" that are bound to occur, the pilot may expect to find winds aloft forecasts reasonably close to the winds encountered in flight.

## Navigation Notes

**New York Area Changes**

Supplementing the removal of the old *Flatbush* compass locator station to the site of the decommissioned *Idlewild* Low Frequency Range, the *Newark* Low Frequency Range will operate on or about Aug. 1st on 379 kc, the frequency previously at *Idlewild*. Use caution when on instruments in this area; use your charts, not your memory.

**Cleveland Area**

The installation of a compass locator station has been approved for the Back Course of the Cleveland ILS.

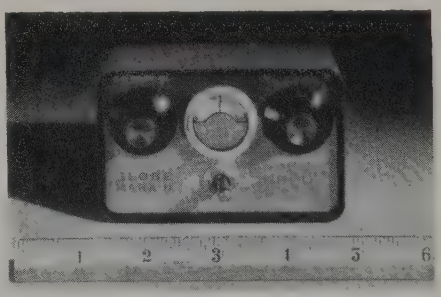
**Washington Area**

All inbound aircraft landing National Airport are requested to contact Approach Control on initial contact, regardless of weather.

This procedure to ease the frequency congestion on the overburdened tower Local Control has met with outstanding success in other locations, and will be tried initially at DCA through the end of July.

## Magnetic Heading Autopilot For Light Business Aircraft

The new Mark II two-control autopilot locks single engine business



aircraft on to a magnetic heading, according to Globe Industries, Inc., Dayton, Ohio.

The system is built around the Globe Gyro/Stabilizer, which has been on the market for three years, and incorporates a specially designed precision magnetic compass, dampened to counteract northerly turning error. Globe's Mark II is CAA approved for installation on Cessna 170, 172, 180 and 182, and Piper Tri-Pacer series aircraft.

The decision to control the aircraft's heading with magnetic compass rather than a conventional directional gyro, grew out of a desire to avoid the gyro's drift characteristics. The magnetic compass of the Mark II was specifically engineered for autopilot application, and is independent of existing instrumentation.

Installed, the Globe Mark II enables the pilot to set any *magnetic* heading into the system, where it is "memorized" until changed purposely. The aircraft then flys the heading automatically.

Both the earlier Globe Gyro/Stabilizer and the Globe Mark II are compatible building blocks leading to a full autopilot for business aircraft. Each unit is planned to supplement earlier parts of the system so that the aircraft owner may add to his Globe G/S as his needs require and money permits.

The Mark II control compass is located aft of the baggage compartment, eighteen inches away from local magnetic and electrical interference. Because of its remote position, it becomes the most accurate compass in the aircraft. Optional equipment includes a remote compass indicator for displaying the magnetic heading on the instrument panel.

A dash-mounted Push-Pull control engages the unit. A compact, attractively styled command console mounts on the hub of the control wheel.

A function switch places the unit on Standby (STBY), Gyro/Stabilizer (G/S), or Heading/Lock (H/L). With the function switch on STBY, the remote compass indicator, which can replace the ordinary floating magnetic compass, is operative while the remainder of the system is ready for use.

With the function switch on G/S, or STBY, and the Push-Pull control engaged, flight is automatically controlled by a rate gyro, which provides short term heading sense, and inherent spiral stability. To make stable, controlled turns, the Trim-Turn knob is moved left or right, automatically placing the aircraft in a turn up to a rate of 3° per second. The turn will not tighten into a spiral dive. The G/S portion of the system has a warm-up time of only two seconds.

When the pilot wishes to lock the aircraft onto a magnetic heading, he uses the Trim-Turn knob to achieve essentially straight flight on the desired heading. This heading is set into the system by centering the needle of the Heading Trim Meter with a Trim Switch. The heading is then locked into the system by moving the function switch to H/L. Since heading is continuously controlled by the system, the pilot is free to tune radios, check maps, or relax on cross-country flights.

Unlike a full autopilot, the Mark II does not control the pitch axis. Light business aircraft, once properly trimmed, tend to remain in pitch equilibrium, hence the primary need is for directional control, says Globe.

The Globe Mark II sells for $1350, F.O.B. Dayton. Installation, labor, on the average, adds $90 or $100. The price for the optional remote compass indicator system is $95.

Those who now own a Globe Gyro/Stabilizer may add a Mark II kit to their existing unit. Cost for the conversion kit is $725, and includes Heading/Lock assembly, command console, and all installation parts together with full instructions.

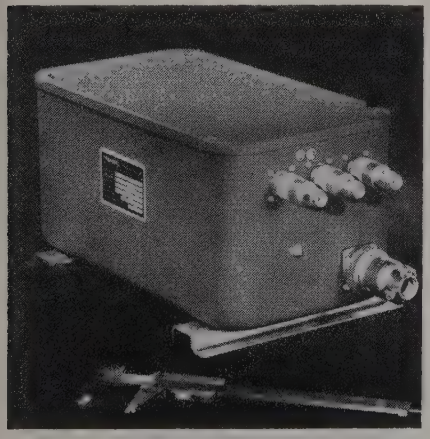
## Sperry Radar System Features Pilot's Indicator

Latest feature of Sperry's APN-59 radar system is a pilot's auxiliary indicator, shown here mounted in the cockpit of an Air Force C-97. Like that

used by the navigator, the pilot's indicator uses a 5-inch cathode ray tube with excellent definition for viewing of targets located at distances up to 240 miles. Unique in its field, the pilot's indicator may be held on a relative bearing type of presentation while the navigator's indicator is *oriented* to magnetic North or some other preselected compass setting. The APN-59, smallest and lightest radar for its power and range, is used in Air Force troop-carrying transports and cargo aircraft for search and surveillance, storm detection and other all-weather navigation purposes. (Ed. Note;—Of equal interest is the almost criminal curtailment of cockpit visibility evident in this photo. Unfortunately this type of radar is not best suited to airborne traffic information!)

## MHF Antenna Loading Unit Eliminates Trailing Wire

A new automatic MHF antenna loading unit has been developed by Transval Engineering Corporation, Culver City, California. Designated Model TLU-6, the unit was developed espe-



cially for aircraft operators preferring to use fixed antenna instead of the high drag troublesome trailing wire antenna. It covers the two to ten megacycle frequency range and operates from either 14 or 28 volt systems.

The unit selects the proper loading of the fixed antenna for any of six preset transmitting and receiving frequencies. The Model TLU-6 incorporates specially developed linear solenoids that actuate the loading circuitry to match the antenna to the aircraft radio at the desired frequency. This design eliminates the need for troublesome rotating coils, motors and tubes.

The Model TLU-6 Transval antenna loading unit is compact, weighs only 6 pounds, is inexpensive to install, and requires no shockmounts. It is now possible to have excellent MHF radio performance with a fixed antenna.

## CAA Running Traffic Control Tests With Volscan

Military-developed VOLSCAN is under evaluation by the Civil Aeronautics Administration to determine its possible application in civil air traffic control. The evaluation tests are being run under the sponsorship of the Air Navigation Development Board at the Navigation Laboratory of the U.S. Air Force Cambridge Research Center, Deer Island, Mass.

VOLSCAN is used as an adjunct to radar for sequencing large numbers of aircraft into position for approach to the airport at intervals as short as 30 seconds. It feeds radar information through its radar tracking circuits into computers which determine the track that each aircraft in a terminal area should fly to establish the correct time separation as the aircraft turn into a final approach.

CAA technicians and air traffic control personnel from Washington, regional control facilities and from the Technical Development Center at Indianapolis and Franklin Institute are conducting the tests which are scheduled in two phases. The first phase includes indoctrination by Air Force personnel into the use and operation of the equipment. The second phase calls for flight testing with "live" military and civil aircraft under VFR (Visual Flight Rules) conditions.

Additional tests will be conducted in the fall at Eglin Air Force Base, Fla., in conjunction with the U.S. Air Force scheduled program for operational evaluation of the VOLSCAN equipment. Plans also are being formulated for CAA participation in tests with similar U. S. Navy equipment at Patuxent.

In addition to the CAA team conducting the evaluation, CAA has invited representatives from the Air Transport Association, Aircraft Owners and Pilots Association, Air Line Pilots Association, U.S. Air Force, U.S. Navy and U.S. Army to observe the tests. Air Transport Association has offered assistance in arranging for airline aircraft to participate in the tests if required.

## "Building Block" Transmitter Units Offered by ARC

By the addition of a second Type T-20 ARC 20-Channel VHT transmitter (using the same antenna, controls, receiver and accessories), receiving channels are increased to 40. The units are designed and sold to operate with either the ARC Type R-15 Receiver (108-135 mc) or the ARC Type R-19 Receiver (118-145 mc) to provide a powerful, rugged 2-way VHF voice radio set.

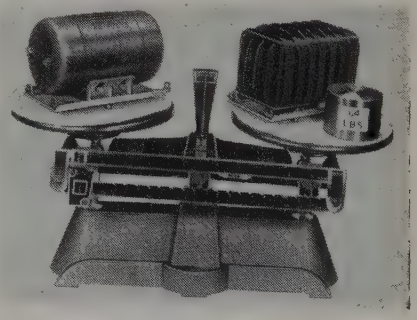
## All-Transistor Power Unit For Receivers Developed By ARC

A completely transistorized unit with no moving parts and weighing only 1.6 pounds is announced by Aircraft Radio Corporation of Boonton, New Jersey.

To be known as the DVIOA Dynaverter, it will replace dynamotors in nearly all ARC aircraft radio and navigation receivers. Variations of the DVIOA, with special mountings, have been and will continue to be designed for customers who wish to replace the rotating (dynamotor) equipment with the all-transistor Dynaverter.

Special advantages claimed, are:

1. A weight saving of approximately 50 percent.
2. Absence of moving parts (i.e., brushes, bearing and armatures) cuts maintenance costs, eliminates needs for lubricating.
3. There are no known limitations on operating efficiency at high altitudes.
4. High efficiency is attained in filtering out r.f. noise, and none addi-



tional is expected to develop during life of the Dynaverter.

The Dynaverter is surrounded, except on the bottom, by die cast aluminum fins to keep the temperature down. ARC's Dynaverter is designed for input voltage of 24 to 28 DC, with a nominal of 27V. Input current is at 2.3 amperes. Output voltage is 270V DC at 150 milliamperes.

ARC expects to complete replacement of dynamotors in production receivers within approximately a year. The Dynaverter will be available for replacements in existing receivers, isolation amplifiers and cockpit amplifiers by the end of June this year.

*(Continued on page 44)*

# SAFETY EXCHANGE

## Panic in the Streets?

*Excerpts from a speech by Rep. Harry G. Gaskell, Jr., in the House of Representatives, May 13, 1957.*

"The Grand Canyon crash last year caused a terrible public shock. In the past ten years, there have been 131 mid-air collisions in this country between civil aircraft, of which 17 involved commercial transports. There were 452 near-collisions reported to the CAB in the last four months of 1956, which means they occurred at the rate of about four every day.

"The plain truth is that near-collisions in mid-air, of disastrous proportions, are being narrowly averted *every day* only by the emergency action of skilled pilots or by Providence. I have some previously withheld reports from the CAA which document in vivid detail a series of near-collisions, typical of the ones occurring every day. I have deleted the names of the owners of the planes and the pilots because it would serve no useful purpose to disclose them.

"This information has not been made public apparently for fear that it might cause some sort of public hysteria. The air traffic problem is, of course, a primary concern of the people who fly in commercial airliners or private aircraft, but a mid-air collision could bring disaster to people on the ground. The crash of two planes over California last fall, narrowly missing a large school, points up the danger to people in residential areas.

"On April 15, 1957, I introduced legislation to establish an Airways Modernization Board. I am ready and anxious to introduce any additional legislation which may be needed.

"The CAB has been able to pinpoint on ground locations 369 of the 452 near-collisions reported to it last fall.

"A total of 101 of these near-disasters occurred over the nation's *eleven largest metropolitan areas* in which 41 million people live! Twenty-two near-collisions occurred over Los Angeles; 21 over Washington, D.C.; 14 over San Francisco and Oakland; 13 over New York; 9 each over Detroit and Chicago; 6 over St. Louis; 3 over Boston; 2 over Philadelphia; and one each over Pittsburgh and Cleveland. And remember that these 101 near-disasters occurred in just four months, an average of one a day!

"An additional 155 incidents out of the 369 were located over other principal cities. These total figures mean that about two near-collisions a day happen *over densely populated areas.*

"We believe there are additional incidents, wholly within the military jurisdiction, which also have been occurring over population centers, and we have been looking into this aspect of the problem. This is the information I believe the public is entitled to have.

"Generally speaking, near-collisions happen in two ways. First, there is the situation where one plane is moving along on a normal course and another plane seemingly pops out of the nowhere on a collision course and the two aircraft narrowly miss each other.

"Here is an official report of such an incident which occurred over Philadelphia on October 13, 1956. A commercial airliner was passing over Philadelphia at 10:50 in the morning in a sky with scattered clouds. At 10:51, the pilot called the tower and reported that a jet just missed him doing a slow roll at the same altitude and went off into the clouds. To this day no one knows where the jet came from.

"In another incident a commercial airliner took off at 11:24 A.M., from Baltimore, on February 8, 1957, in ground fog and haze. Approximately one mile from the end of the runway, the airliner made an abrupt left turn to avoid a helicopter which suddenly appeared. Almost immediately, three more helicopters appeared out of the fog. No radio contact could be established with the helicopters and no one had been aware that they were in the area.

"The second way these near-collisions happen is when two aircraft arrive by mistake over the same check point, at the same altitude at about the same time. C.A.A. regulations call for 10 minutes separation between planes at the same altitude.

"Here is an actual report of a hair-raising incident of this type. I think it is especially fitting to call the following item to the attention of the members of Congress because it happened over the Riverdale checkpoint near Washington. On April 7, 1956, two commercial airliners left Newark within a few minutes of each other for Washington. (Ed. Note: Cleared at 6000 and 8000 respectively.) I will read the recorded conversation of the two pilots which describes the incident far better than I could.

"At 7:19 P.M., one of the pilots asked the Washington Traffic control Center, 'Is there anybody below us at Riverdale?' The Center replied, 'Not on this estimate.' There was a pause, then the Center said, 'Apparently there is.' The pilot of the other airplane radioed the Center and reported he was also over Riverdale at the same altitude. The Center advised, 'There is one flight on top of the other.'

"One of the pilots said, *'It's a close one!* We've been feeling some prop wash and have been looking around. Apparently we're right behind you all the way.' The other pilot called the Center and said, 'All right Center, let's quit playing around and get some separation and get somebody down out of here.' Except for sheer, blind *luck*, there was another Grand Canyon crash in the making.

"Here is another equally dangerous near-miss caused by the simultaneous presence of two commercial airliners at the same spot. Two northbound planes left Florida on January 15, 1957, headed north at 17,000 feet. They were scheduled to have 14 minutes separation. At 7:55 P.M. both planes reported over Norfolk, Va. at 17,000 ft. The Norfolk center was unaware that one of the planes had arrived in the area about 14 minutes ahead of schedule, thus putting both planes in the air over Norfolk at the same time and altitude, with neither knowing the other was there.

"These are the problems we must deal with if we are to avoid a series of air disasters in the future. And the problems will be compounded many times when the new high-speed jet transports go into service next year.

"I believe there are *five* steps which should be taken immediately by the Congress, by State and local governments and by the aviation industry.

"*First*, the CAA needs more and better radar in the air traffic control systems. Some of the radar still being used is surplus military equipment from World War II!

"*Second*, the CAA controllers need electronic flight-posting equipment to help them keep track of flights as they move along the airways. This will replace the cumbersome and hard-to-use paper strips that are now used.

"*Third*, the CAA needs more personnel to handle the volume of air traffic that is growing every day. I am told it takes 18 months to three years to train a competent air traffic controller.

"*Fourth*, we need substantial improvements at our airports to provide more landing facilities, high-speed taxi lanes, and more gate-space so that planes do not become stacked up over our large cities waiting their turns to land. This is primarily a responsibility of State and local governments.

"*Fifth*, we need some sort of anti-collision warning devices in the planes to let pilots know of other aircraft approaching them. This is a job which should be undertaken with all possible speed by the aviation industry and perhaps by some of our leading private research organizations. (Ed. Note: Collins Radio has temporarily discontinued work under the development contract awarded them!)

"This problem of air traffic is at the very heart of our national progress. Our national defense depends on air power, and our business and commerce is becoming more dependant every day on the high-speed travel of modern aircraft."

## Synthetic 'Glowworm' Provides Fail-Proof Night Markers

Development of a "light that never fails" has been announced by the Air

Materiel Command. The light, which will glow in the dark for more than five years, is slated for use in illuminating entrance and escape hatch door handles on long-range jet bombers. Its commercial possibilities for emergency exit guidance are obvious, current systems relying on such non-failsafe techniques as battery powered lights, which are subject to human frailties of maintenance and replacement.

The light source is a small piece of Strontium-90, a specially treated radioactive metal which is *safe-sealed* in a transparent plastic button. It glows continuously and, in the event of a night emergency involving a failure of the regular light system, the synthetic "glowworm" would guide personnel safely to exit doors and hatches.

Another possible use for the synthetic "lightning bugs," according to AMC, might be their adaptation as wing-tip markers. On many airports, location of limited parking areas introduces considerable hazard to and from moving traffic in the dark. Use of wing-tip position lights for extended periods is impracticable and the widely extended configuration of most aircraft wings from the fuselage bulk makes night perception hard, even with wing lights of taxiing aircraft on.

## Propjet Engine Digests Hard Metal Bolt

Business aircraft operators contemplating operation of the up-coming prop-jet and jet commercial aircraft will face a new difficulty, that of finding sufficient airports with immaculately clean runways and paved surfaces. Turboprop and jet engines are notoriously finicky about ingestion of any loose hard objects such as nuts, bolts, stones, gravel, etc. Partial or complete failure with expensive repair is the usual result.

Therefore, it is interesting to note that Allison Motors reports that one of their engines, during the progress of a 1000-hr Simulated Flight Endurance test, evidently swallowed a metal bolt or its equivalent. The decision was made to run out the remaining 800 hours before tear-down. It was then found that the highly sensitive compressor and turbine rotor blades and vanes had suffered nicks, tears and dents as much as ¼" deep and 3/16" long. Yet the engine continued to run for 800 hours simulating all the phases of actual operation anticipated!

## Canadian DC-6 Crash Charged To Faulty Go-Around Procedure

(CAB Report Abridged)

Canadian Pacific Airlines Flight 307, a Douglas DC-6B, CF-CUP, crashed following a missed approach at Cold Bay, Alaska, on August 29, 1956. Eleven passengers and four crew members were fatally injured. Three passengers and four crew received injuries of varying degree. The aircraft was destroyed by impact and fire.

Flight 307 departed Vancouver, B.C., enroute to Hong Kong, China, with a refueling stop at Cold Bay, Alaska, and an intermediate stop at Tokyo, Japan.

It reported being over the Cold Bay range station out-bound on a standard instrument approach at 2035, and at 2042 as completing a procedure turn and proceeding in-bound. This was the last transmission from the flight.

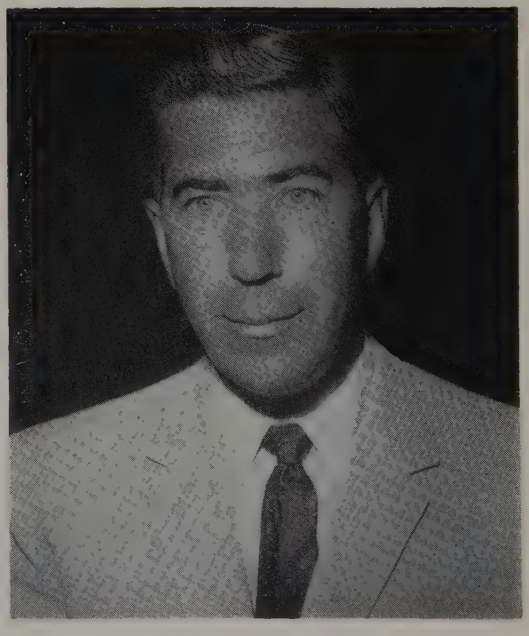
At approximately 2045 the aircraft was observed to descend from the overcast north of the airport for a landing on runway 14 and cross the field at low altitude to the intersection of the two runways. At this point a shallow left turn was started and the aircraft went out of sight southeast of the airport. Very soon thereafter fire was observed in that direction.

The 2045 Cold Bay weather observation was: Indefinite ceiling, 500 feet obscured; visibility 1½ miles; light drizzle; fog; temperature 46 degrees; dewpoint 46; *wind west-northwest at 20 knots;* altimeter setting 29.89 inches.

Examination of the wreckage and ground marks disclosed that the aircraft first struck the ground at an elevation of 10 feet on a heading of approximately 40° magnetic and 4,300 feet east-southeast of the approach end of runway 26. The physical evidence indicates that at the time of impact the aircraft was descending in a slightly nose-down attitude with the left wing down about 15°. Computed ground


Captain W. R. Strong

*Chief Pilot, Nationaly Dairy Products Corp; Pilot of the award-winning DC-3, which was designated "Flagship of the U.S. Industrial Fleet" at the Eighth Annual Reading Maintenance and Operations Meeting—1957. ATR; member NBAA; QB; million-miler. Former test pilot and Federal Airways Inspector for CAA, Region 5. Chief Pilot for National Dairies since 1945.*



"I believe we owe it to our passengers and our profession to keep proficient and up-to-date.

"That's the reason we participate in FLIGHT SAFETY, INC.'S Professional Pilots' Refresher Training Program.

"Their equipment and professional instructors are the best I've found anywhere!

"Particularly, I appreciate being able to do most of my flight training under controlled conditions in the Flight Translator."

*Flight Safety, Inc.*

Municipal Airport
Houston, Texas

LaGuardia Airport
New York

Midway Airport
Chicago, Illinois

speed at impact, based on propeller governor settings and propeller cuts in the ground, was approximately 186 knots. The wreckage area, approximately 500 feet by 1,500 feet, showed the scattering of components to bear a general heading of 40° magnetic.

Examination of the aircraft wreckage disclosed no evidence, as far as could be determined, of an inflight structural failure of the airframe or malfunction of its systems.

There was no indication of inflight structural failure or malfunction of the engines, propellers, or their related accessories. Examination of the propeller and propeller governors indicated that the blades of all propellers were at a blade angle of approximately 40° and that the engines were operating at an average speed of 2,460 r.p.m. at the time of impact. Computations show that each of the four engines was delivering approximately 1,385 horsepower at impact, which is slightly more than cruise power.

The airline's Operations Manual, according to testimony of the chief pilot, specifies that, in the case of a missed approach, METO (maximum except takeoff) power is applied, the gear is retracted, and the flaps are retracted to 20 degrees for the climbout. METO power of the aircraft involved was 1,900 h.p. and 2,600 r.p.m.

The landing gear and wing flaps were determined to be in the up, or retracted, positions at the time of impact.

Ground witnesses testified that the aircraft, during its pass over runway 14, was flying at an estimated altitude of 100-200 feet above the ground, with the landing gear down, and landing lights on. The company dispatcher, standing on the ramp, observed the flight break out of the overcast, appear to be making a landing, and then turn (with power applied) to the southeast over the intersection of runways 14 and 26 in a shallow climb from its estimated height over the runway of 50 to 75 feet.

None of the crew survivors recalled any aircraft operating difficulties prior to the impact. One flight crew member, who was resting in a crew sleeping compartment, stated that the approach from over the range station did not seem as smooth as usual, the power was changed frequently during the descent, and that the power applied for a missed approach seemed less than normal. He also said that he thought there was a feeling of "sink" just before the ground contact. The duty navigator, who was unable to see either the two pilots or the outside because of a blackout curtain between his seat and the pilots', testified that he overheard Captain Tweed say, "No, Phil" (See Ed. Note.) when power was being applied over runway 14. He also observed a reading of 160 feet on his altimeter at this time. This altimeter was set at 29.92 inches, which produced a reading approximately 30 feet higher than true.

The Cold Bay Airport is located on the Alaskan Peninsula, 572 miles southwest of Anchorage, Alaska. Its elevation is 93 feet. The two runways, 14-32 and 26-8, are 7,500 and 5,000 feet in length, respectively. Navigational facilities in operation at Cold Bay consisted of a low frequency range, without voice, equipped with a VHF station location marker. The range is located 2.2 miles northwest of the airport. The low frequency range was flight-checked following the accident and found to be within allowable limits.

The airport is equipped with a rotating beacon and high-intensity runway lights that can be operated on only one runway at a time. During Flight 307's approach, the high-intensity runway lights were lighted on runway 14, as were the high-intensity approach lights to the runway.

The ceiling and visibility landing minimums for Canadian Pacific Airlines DC-6 flights at Cold Bay are 400 feet and one mile for straight-in approaches at night, and 500 feet and 1½ miles for circling approaches. The letdown for the approach to Cold Bay was through an overcast and the ceiling and visibility at that time were reported as 500 feet and 1½ miles. The surface wind was reported west at 20 knots, and terrain effects may have produced light to moderate turbulence at altitudes below 2,000 feet.

(Captain Phillip D. Iverson, who occupied the left seat at the time of the accident, had been qualified as a captain on Canadian Pacific Airlines domestic lines for over 10 years prior to assignment to the Overseas Division. Company records showed that Capt. Iverson was qualified according to company policy and Canadian regulations as a captain in the DC-6B. At the time of the accident he was in the process of qualifying over the Vancouver-Hong Kong route. Company policy required that this include several flights under the supervision of a captain already qualified. This was being accomplished under Captain Thornton A. Tweed on this flight, one of a number of such trips.)

*Analysis*

It is probable that the intention of the pilot during the approach was to land on runway 14, a straight-in landing from the inbound overheading of the range station. The breakout, after descending through the overcast, may have been too close in and high and these factors, together with excessive ground speed due to a quartering tailwind, may have caused the captain to decide to go around.

Whether the flight intended to turn and climb to 2,700 feet on the north leg of the Cold Bay range, as the missed-approach procedure prescribes, or to circle under the 500-foot ceiling and land on another runway is not known. Considering that very little altitude was gained after the application of power it is probable that a circling approach had been decided upon when the left turn from runway 14 was made.

Since the wing flaps during the circling approach would be extended 20 degrees, and since they were found in the fully retracted position, it is believed that they were retracted shortly before impact. Fully retracted wing flaps at this time would explain the feeling of "sink" experienced by the off-duty flight crew member.

The Board believes that the airspeed of the aircraft at the time the flaps were retracted was approximately 130 to 140 knots. This is supported by several facts. According to company procedure it is normal on the downwind leg of an approach to a runway for the aircraft to fly at an airspeed of approximately 140 knots with wing flaps extended 20 degrees. Since the subject aircraft was in a clean configuration (gear and flaps up) immediately prior to the accident, with a tailwind of approximately 20 knots, it would be reasonable to assume that the speed of the aircraft increased during the final descent. When the aircraft passed over runway 14 it was in landing configuration. Since only slightly better than cruise power was applied at this time, and as the distance to the point of impact was approximately one mile, it is unlikely that the speed of the aircraft would have been much greater than 140 knots when the flaps were retracted.

It is evident that the aircraft struck the ground while descending in a slight left turn and while all four engines were not operating at the prescribed power settings necessary to execute a missed-approach procedure.

*Probable Cause*

The Board determines that the probable cause of this accident was the full retraction of the wing flaps at low altitude during a circling approach with-

*San Francisco Bay Area 1957 Engine Operation and Maintenance Forum jointly held by Pacific Airmotive Corp. and Pratt & Whitney Aircraft took place May 20th at the Hotel Claremont, Berkeley, Calif. A Pratt & Whitney luncheon was followed by the forum itself, and the affair closed with PAC's Hangar Flying Cocktail Party.*

out necessary corrective action being taken by the crew.

[Ed. Note: Although there appeared to be a difference of opinions between the Captains as to either the operational decision or the technique of the maneuver at the time, it is obviously impossible to determine whose choice finally resulted in the subsequent action. But it is quite possible that this difference of opinion, generating confusion at a critical point, stemmed from an understandable lack of established teamwork as a crew. See "PROBLEMS OF CREW MANAGEMENT" JUNE '56 SKYWAYS.]

## Mid-Air Collision Laid To "Heads Down And Locked"

(CAB REPORT ABRIDGED)

On September 9, 1956, a Continental Air Lines Douglas DC-3A and a Cessna 170B collided in flight approximately two miles southeast of the Phillips Airport, Bartlesville, Oklahoma. Both aircraft, substantially damaged, were landed safely at that airport. There were no injuries to the passengers or crew of either aircraft.

Flight 190 was scheduled between El Paso, Texas, and Kansas City, Mo., with intermediate stops among which were Tulsa and Bartlesville, Okla. The flight from Tulsa to Bartlesville was planned and operated in accordance with visual flight rules.

Ten minutes after leaving Tulsa the captain advised his company that the aircraft was in range of Bartlesville. Some time after the captain initiated his first radio call the first officer began the "in-range" cockpit check. This check took approximately 30 seconds and just as it was completed the collision occurred. At the time of collision the DC-3 was continuing north and about to enter the downwind leg of the airport traffic pattern on a reciprocal heading to the intended landing on runway 17.

The Cessna took off from Dewey, Oklahoma, Hi-Way Airport, 3 miles northeast, at approximately 1417. The flight was a sight-seeing trip from Dewey to Bartlesville. As the Cessna completed a 45-degree right turn to the northwest the two aircraft collided. Both aircraft were landed safely at the Bartlesville Airport. The weather at the time of the accident was *clear, visibility 15 miles,* wind south 10 knots.

DC-3 DAMAGE. The right aileron lower fabric covering was cut a distance of 13 inches by the propeller of the Cessna, at an angle of 45 degrees from the lateral axis of the aircraft. This cut also damaged the seventh aileron rib and the spar lower cap. A second cut began about two inches rearward from the inboard end of the first cut and extended in the same direction through the trailing edge, cutting both lower and upper surfaces.

The right horizontal stabilizer and elevator were severed diagonally at an angle of 43 degrees with the fore and aft axis, inboard and rearward *from the stabilizer tip through the elevator trailing edge.* Both surfaces were cut upward and the lower surface of the tip contained red paint similar to that on the propeller hub spinner of the Cessna. The outboard *elevator hinge bracket was broken* and the lead counterweight was severed upward. *The elevator torque tube and four ribs were cut and broken* upward. All severed parts were recovered.

CESSNA DAMAGE. The leading edges of both metal propeller blades were scarred, nicked, and abraded and one tip was *curled forward.* The propeller hub spinner was crushed and torn and the upper left nose cowl was crushed rearward. The upper left engine cowling was torn free along the center hinge line and the upper engine baffling on that side was crushed. Sparkplugs from cylinders Nos. 4 and 6 were *torn from the cylinders* and broken. The right side of the windshield was scuffed and cracked as if struck by the cowling when it left the aircraft. At a point about eight feet outboard from the root, the leading edge of the left wing was flattened for a distance of 10 inches and there were abrasion marks and scratches sloping inward at an angle of 25 degrees. There was no evidence of fire having occurred in either aircraft.

Computations, using the angles of the propeller cuts on the DC-3 aileron and tail surfaces, the Cessna propeller r.p.m. and diameter, and the furnished airspeeds, produce the following results: Angle of convergence of the two aircraft—44 degrees; rate of closure—98 m.p.h. (144 feet per second); viewing angle of Cessna from DC-3—52 degrees to the right; viewing angle of DC-3 from Cessna—84 degrees to the left.

The purpose of the Cessna's flight was to take four children for a short trip over Bartlesville. After taking off, the Cessna proceeded about four miles due south and then turned westward at an altitude above the ground of 1,000-1,100 feet. According to the pilot, who was in the left front seat, after reaching a point where the home he had been visiting was seen to the right by occupants of the Cessna, a 45-degree turn was made to the northwest. While coming out of this turn, the collision occurred. The Cessna pilot stated that he did not intend to land at Phillips Airport and was not aware that he was nearing the airport traffic pattern. His two-way radio was not turned on. The pilot also stated that the visibility was unlimited and that the sun did *not* interfere with his vision when on a west heading.

Shortly after making the in-range report approximately ten miles south of Bartlesville the copilot of the DC-3, seated on the right side, started the in-range cockpit check. This portion of the cockpit checklist consists of seven items, the last being a check of hydraulic fluid which requires that the copilot *turn left towards the rear* of the cockpit in order to see the fluid quantity indicator. The collision occurred at this time. The captain's scope of vision, from his seat on the left, is hampered by the compass and radio installation located over the center of the instrument panel and at the bottom center of the windshield. The in-range checklist usually takes about 30 seconds to accomplish. The DC-3 crew also testified that the form of haze present at low altitudes, coupled with the variegated background of the populated area of Bartlesville over which they were flying, would make it difficult to spot the small, aluminum-colored aircraft. They were at the correct altitude to enter the downwind leg of the airport traffic pattern.

The airport at Bartlesville is operated by the Phillips Petroleum Co. Local traffic at rules at Bartlesville stipulate left-hand turns on two patterns—a larger, circular pattern for large aircraft to be flown at 1,000 feet, and a smaller, rectangular pattern for small aircraft to be flown at 500 feet, for all aircraft in flight below 1,500 feet above the surface (2,215 feet m.s.l.) within a three-mile radius of the airport. This airport is classified as uncontrolled, i.e., there is no control tower.

Bartlesville Radio (BVO) is owned and operated by the Phillips Petroleum Company. The radio operator is not licensed by the CAA as an airport traffic control operator—nor is he required to be—and only limited advisory service, to be used at the pilot's discretion, is furnished to flights operating into the airport.

*Analysis*

It is apparent that the attention of the Cessna pilot was largely directed to his right as he approached over the area of his hosts' and passengers' homes. While the Cessna was proceeding westward, 60 seconds before the collision, the DC-3 was three miles away and about 45 degrees to the left of the forward view from the Cessna. Thirty seconds before the collision, the DC-3 was 1½ miles away *at the same bearing.* The altitudes of both aircraft could not have differed more than 100-200 feet during this time. It seems that regular scanning of the horizon by the Cessna pilot during the last minute or so before the collision would have revealed the DC-3.

This applies equally to the co-pilot of the DC-3 seated in the rightside pilot seat. If 30 seconds, ending at the time of collision, was required to complete the in-range cockpit checklist, there was at least a prior minute when the Cessna would have been visible on a bearing of about 45 degrees to the right and near the altitude of the DC-3. Other than the cockpit check there were no duties requiring attention inside the aircraft at that time, according to crew testimony.

The Board is of the opinion that the DC-3 flight crew were aware of all restrictions to cockpit visibility and the necessity for continual outside scanning. Such a scanning is necessary even though it requires a break or interruption in cockpit duties. Both aircraft were flying VFR under weather conditions far better than VRF minimums. Consequently, the Board believes that the entire responsibility for observing

and avoiding other aircraft rested on the pilots of the two aircraft involved in the accident.

*The Probable Cause*

The Board determines that the probable cause of this accident was the failure of the pilots of both aircraft to observe and avoid the other aircraft.

## Clear-Air Turbulence

As the airspeeds of business and executive aricraft increase, the subject of hazardous turbulence becomes increasingly pertinent. No professional or competent business pilot needs reminders about the probability of dangerously rough air in IFR conditions, or in the vicinity of known thunderstorms, or below fair-weather cumulus clouds.

What does seem to be easily forgotten is the threat of severe turbulence *in CAVU conditions.* Standing waves in the lee of high mountain ranges, frequently at altitudes well above the terrain-clearance standard of 2000 ft, are well known phenomena to soaring enthusiasts. Still, they frequently surprise other pilots when they get hit in crystal clear air.

Wind shear lines when little or no cloudiness exists, are familiar to jet pilots inadvertently stumbling into a jet stream at very high altitude, but shock pilots of conventional aircraft meeting up with them at high, but unpressurized flight levels.

Sometimes, although not often enough clear air turbulence can be predicted in the course of a thorough, pre-flight briefing. And on landing approach, wind shear, representing a sharp change in direction and/or velocity, has produced many a fall-out and undershoot. (It is suspected that many landing and takeoff crashes charged to other causes were caused by, or contributed to by, this factor.)

Lastly, and most critical, the vortex trails of jet aircraft, large or small, are deadly for as long as minutes after their passage. Large aircraft have been seriously damaged and, in at least one instance, a single-engine business-type aircraft was observed to break up after intersecting the wash of two jets at least one-half mile behind them.

In a survey made by CAA of injury suffered in airline incidents of severe turbulence through the years 1946-1955, 18 of the 44 accidents occurred *in clear-air conditions.* In short, one out of three instances of record were unanticipated because of apparently undisturbed air and good weather.

It is easily understood why passengers, who normally consider full-time use of seat-belts uncomfortable, can be injured when clear-air turbulence is unexpectedly encountered.

It is *not* clear, however, why professional crew members in the cockpit are sometimes caught off guard, and injury or temporary loss of control results. The use of seat-belts whenever at the controls produces no associated discomfort at all, and for landing or takeoff a properly-used shoulder harness is virtually free insurance.

In such instances when settling or fall-out occurs, the extent to which the crew are not displaced from their seats has a direct relationship to their ability to exercise necessary emergency control to recover the situation.

Because clear-air turbulence is usually of brief duration, as well as sudden, there is rarely much opportunity to take safety action before the rough air is past. Nevertheless, until it has passed, or if it has been anticipated, the standard techniques of retarded throttle and delicate handling of the controls are mandatory. (If using the autopilot, switch it off and go to manual as soon as turbulence is suspected. Tie down all loose articles. Pencils have been known to bounce from cowlings and jam flight controls!)

Slowing down to speeds such as stall-plus-50%, and other favorite preventatives, plus use of the seat-belt sign in the larger business aircraft, are not wasted effort, even if no turbulence appears . . . no more wasted than fire insurance if your house doesn't burn down!

## Nominations for Safety Award

Nominations have now been taken by the NBAA for the third annual Kansas Women's Aeronautical Assn.'s Business Flight Safety Award.

NBAA administers this award each year, and Ralph Piper, NBAA Board member, is chairman of the Awards Committee for 1957.

(Mr. Piper, chief pilot for Monsanto Chemical Co., authored the article in May SKYWAYS, "Has Your CAA Seemed Different Lately?," page 18.)

The award itself will be a trophy, and is considered one of the highest honors for the advancement of business flight safety.

*Ralph Piper, chief pilot for Monsanto Chem. Co., is 1957 chairman of Awards Committee for Business Flight Safety Award of Kansas Women's Aeronautical Association.*

## ALPA Head Adds Suggestions To Those of the Curtis Report

C. N. Sayen, president of the Air Line Pilots Assoc., testified before a Senate committee, recommending certain modifications in the legislation now being considered as a result of the Curtis Report.

Sayen listed these recommendations:

(1) Any research and devolopment program should concern itself first with *immediate* practical problems. To this end, Congress and all other interested parties should lend full support to CAA's present program to alleviate currently critical areas of operation.

(2) For most effective coordination, a research and development agency (The Airways Modernization Board) should *not* be separated from the CAA. Responsibility for aviation facilities should rest with a single agency. For this agency, a single head should be appointed by the President, confirmed by Congress, and responsible to both.

(3) The authority to allocate airspace should reside in the same agency responsible for operation of the airways system and for research and development to keep the system competent to meet current requirements.

Finally, Sayen said, "The present airways problems would best be solved by immediate legislation which would place the responsibility for research and development in aviation facilities planning, the operation of the airways, the allocation of airspace and allied responsibilities under a single agency having a single head."

Sayen pointed out that, aside from these proposed modifications, ALPA was in basic agreement with "many of the conclusions and objectives recommended by the Curtis Committee."

## ATR Suspension Upheld for Mid-Air Duel

The initial CAB decision in the case of the TWA Captain charged with deliberately climbing through another aircraft's altitude in IFR conditions, has been released and excerpts therefrom are:—

"In the opinion of the examiner, the irrefutable and decisive evidence is to be found in the conversations between Captain Specht and the Center which transpired and which faithfully record the words and mood of the parties involved. The tape was played back in the presence of the Respondent at the hearing, and subsequently was heard by the examiner.

"The transcription of the dialogue which took place between 1027 and 1048 reveals the speciousness of Captain Specht's attempt to read into these transmissions a plea for assistance to avert an emergency arising out of a serious icing condition. However revealing these transmissions may appear in cold type, they cannot reproduce either the manner in which they were delivered nor the tone of voice employed. Hearing his words and the manner in which they were delivered makes it manifest that Captain Specht was truculent and in an angry mood. There is no suggestion whatsoever in his utterances that Captain Specht was in an emergency situation or had any other purpose than to obtain a preferred altitude. There is every indication that Captain Specht felt that he was entitled to this altitude and would brook no interference in his determination to obtain it.

"To one listening to the tape, Captain Specht's transmissions at 1027½: "We're going to leave 14,000 in about three minutes—you get him out of the way," is unexpected and a complete *non sequitur* which, taken in conjunction with his inflection, produces a rude

*(Continued on page 43)*

Chief pilots Frank M. Briggs and Richard Vinal (L/R) discuss with Fisher extensive flight testing with Champions. Veterans of 22 years with Pan American World Airways, the two captains are responsible for all Miami test flights for the "World's Most Experienced Airline."

Another in a series on the care taken by leading airlines to maintain top flight efficiency—and why this care has led them to select CHAMPION SPARK PLUGS. Noted aviation authority reports on Pan American World Airways . . .

# "World's Most Experienced Airline"

*by* **HERB FISHER**

*international aviation authority, veteran test pilot, and author*

HERB FISHER

Just Over the Horizon . . .

Crowning the gigantic Pan American World Airways Maintenance and Overhaul base at Miami International Airport—like a royal crest of honor over this gateway to Central and South America—are these brilliantly lighted words: "World's Most Experienced Airline."

No airline slogan has commanded more unqualified global respect. Since the maiden flight of its Jenny-type Fokker F-7 tri-motor "Clipper" 30 years ago, Pan American has distinguished itself with a singular history of world-wide aviation development and airline safety.

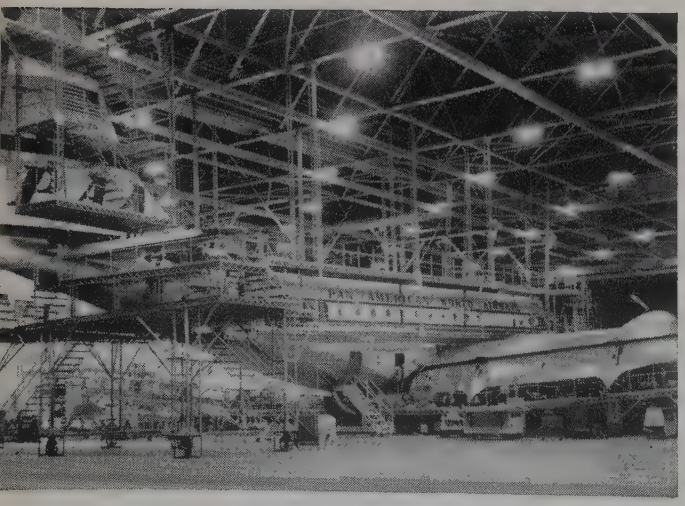
Pan American pioneered transoceanic routes to South America, Europe and the Orient. Its famous Clippers have flown more than 700,000,000 miles—equivalent to 28,000 trips around the globe. PAA has carried well over 10,000,000 commercial passengers to and from six continents and 82 countries and colonies over the Earth.

Pan American told me it has received more awards than any other airline—tangible testimony to an excellence of performance based on experience in operation and maintenance. In international aviation circles, Pan American has become synonymous with efficiency and safety experience.

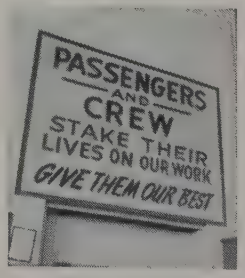
Receiving a cordial invitation, I spent several days inside PAA's Miami Overhaul Base (MOB), delving into why Pan American maintains a top position in the air transport industry. This overhaul base occupies 50 acres, 30 under roof, and employs some 2,500 year-round workers. It's the largest airline overhaul plant in the world . . . home base for Pan American's headquartered Latin American Division fleet, serving Central and South America, as well as overhaul center for PAA's Atlantic Division, covering Europe, Africa and the Middle East.

Establishment of MOB in 1948 marked another historic first for Pan American: first time a mass-production, factory-method operation in airline aircraft maintenance had ever been tried. Now, with more than 10,000 engines alone having been overhauled there these past eight years, MOB is an airline industry model.

Each of Pan American's 135 multi-engine aircraft comes in biennially for complete disassembly—Boeing Super Stratocruisers, Douglas DC-4's, DC-6B's, DC-7B's, DC-7C's, Convairs. The whole ship is dismantled and reconditioned from wing panels to cabin carpeting. Engine parts, for example, are chemically and mechanically cleaned until not a vestige of dust or baked-on carbon remains. Parts are then minutely examined with the most modern inspection equipment to insure their soundness and suitability for reuse. Throughout reassembly stages, each unit is tested for operational perfection.



Like ships of sea, giant Clippers of Pan American, too, must come in for a "dry docking" to insure maximum public safety. They're completely disassembled and reconditioned. A special 75-ton dock of movable and stationary sections was designed by PAA to handle this double-deck "Strato" Clipper, largest commercial airliner in operation.




Self-explanatory are these safety reminders, which Fisher observed throughout the Miami Overhaul Base. Maximum safety efforts from the ground up — up to the stars — put teeth in the slogan, "World's Most Experienced Airline."

Veteran pilots and crew members get constant refresher courses to keep them at peak efficiency. They're required to spend many hours in this "flight simulator," a classroom cockpit duplicating flight conditions.

. . . But, in the Beginning . . .

# "World's Most Experienced Airline". . .

## *a special report for Champion Spark Plug Company*

A look at the immediate future with a nostalgic glimpse into the pioneer past is provided by these two Clippers, the pride of their respective eras. Representative of *Tomorrow's* Clipper is this Douglas DC-8 jet. Pan American's jet Clipper fleet — Boeing 707's and DC-8's — is scheduled for service in 1959 and will transport up to 150 passengers per plane at speeds around 600 mph. *Yesteryear's* Clipper, this Sikorsky S-40, was the first PAA plane to bear the now-famous "Clipper" title . . . also the world's first four-engine commercial seaplane. It was delivered to Pan American 26 years ago.

Finally, the completely reconditioned engine is tested on one of Pan American's giant engine test stands for multiple assurance of functional perfection.

Engine Overhaul at MOB occupies a seven-acre building, where up to 300 engines per month can be completely reconditioned. Ignition system overhaul is done in the Accessory Overhaul building, a structure almost as large as Engine Overhaul.

As a pilot, you're not long in the driver's seat behind an engine before you realize the heart of a powerplant is its ignition system. Having spent more than 12,000 hours aloft behind hundreds of engines, I was most anxious to inspect Pan American's Ignition Overhaul. Here, Pan American reconditions everything from magnetos to spark plugs.

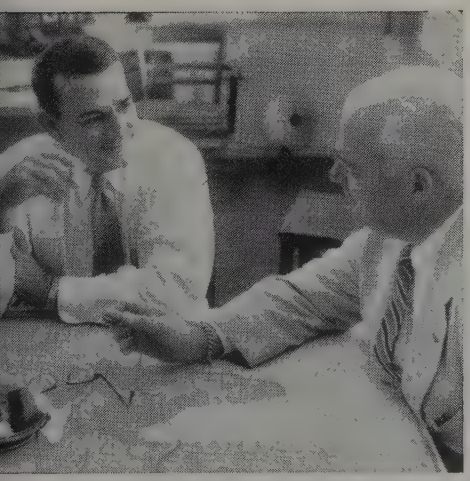
The spark plug, of course, is the vital powerplant life-giver upon which all other plane parts are dependent to stay aloft and safely power millions of passengers millions of miles through all kinds of atmospheric conditions.

As I observed installation of spark plugs in the many types of overhauled engines, the very capable manager of MOB, Santos Ceyanes, explained: "We've used Champion Spark Plugs for years. Occasionally we test other plugs, but we always return to Champions. We fly Champions an average of 350 hours between removals. We've never found a better spark plug, and we've tested them all, extensively. Reliability and performance dictate Champions as our necessary choice. Long life, service and economy bolster those vital requisites of choice."

In selecting a spark plug for an aircraft engine, the engine manufacturer first runs exhaustive tests to determine what plug best meets heat-rating and other operational requirements of the engine, William W. McClintock, powerplant engineering superintendent, told me. Then, a limited quantity of the appropriate plug is released to the airline for flight evaluation. A history of the plug's characteristics—performance, reliability, gap erosion, total life, ease of reconditioning, etc. —is recorded throughout testing. Spark plug histories are carefully compared with those from tests of other spark plugs.

"Champions have surpassed other plugs in these tests since we began using Champions in 1943," Mr. McClintock said. "We find, for example, that Champions give us less lead fouling and electrode erosion while maintaining excellent ceramic stability. MOB-overhauled engines have accumulated millions of high-efficiency hours while using Champions."

As powerplant engineering installation supervisor, Morton H. Woolf heads the engineering staff charged with evaluating ignition system test results. With cold objectivity, then, he selects Champions.



Handy with a tape recorder, Fisher talks to Santos Ceyanes, manager of the Pan American Miami Overhaul Base, about the magnitude of overhaul and maintenance that has contributed to PAA's well-earned safety slogan, "World's Most Experienced Airline."

Douglas A. Shropshire (L), Champion aviation representative, gives technical assistance to (L/R) G. F. Sheppard, an Electronics general foreman, and Clyde Walkup, assistant Ignition Overhaul foreman.

When engines have been reconditioned right down to the last nut, bolt and spark plug, they're reassembled and tested in this Engine Test Cell.

An extra safety precaution is taken by Flight Engineer W. F. Kellegrew, a 15-year Pan American veteran who takes nothing for granted: he double-checks his wing-tank fuel supply preparatory to taking off for Latin America. Airborne, he feels secure behind engines equipped with Champion Spark Plugs.

According to L. R. Sayre, a 27-year Pan American veteran and assistant service superintendent, the calculated decision to use Champions has been remade every year since the original decision 14 years ago.

Henry Mossberger, powerplant engineer directly responsible for ignition engineering problems, told me how the Champion Spark Plug Company has "given every cooperation and assistance" in extending the spark plug lifetime sufficiently beyond that of other plugs, providing the ideal combination of plug economy and reliable performance. "After hours of exhaustive extended-life service tests, we find the die-hard Champion without equal."

At this point, I had been thoroughly checked out in the operation of PAA's massive Miami Overhaul Base by an efficient staff. I'd seen the great Clippers of the "World's Most Experienced Airline" disassembled and reconditioned right down to the last spark plug.

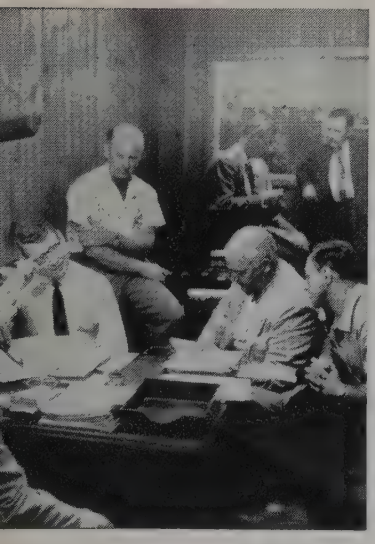
And, in the end, I know—being an old test pilot myself—that it is the pilot himself who has the real throttle-hand appreciation of the engine. Capt. Richard Vinal, assistant chief pilot, technical, and a 22-year PAA veteran, confirmed my feeling: "I run flight tests, demonstration flights and performance checks. In these, we've used Champions for many years. They're unequaled. Herb, I use them in my car—and even in my lawn mower."

Capt. Frank M. Briggs, Latin American Division chief pilot, added: "In my 22 years with Pan American, I've logged more than 16,000 hours—mostly on Champions. Everyone knows the high safety record Pan American has, and, quite naturally, we've guaranteed this safety experience to the public with use of the best possible parts and equipment. Herb, I feel very strongly about the success we've had with Champions."

Over-all, the importance of a vendor's cooperation, and Champion's in particular, was summed up by R. D. Charles, MOB assistant superintendent of overhaul and a 27-year PAA veteran: "Champion's close cooperation and efforts to constantly improve the product—new insulators, for example, and lighter type construction, incorporating the best materials—point up the fact that we are using one of the finest products in the field."

Wherever I went and with whomever I talked there at MOB, the reasons for using Champions became increasingly obvious. Service, reliability, long life and economy seem to sum up Pan American's reasons for unanimous Champion preference.

—by HERBERT O. FISHER



Discussing engineering tests are (L/R) William W. McClintock, Powerplant Engineering superintendent; M. H. Woolf, Powerplant Installation Engineering supervisor; Fisher; and H. I. Mossberger, Powerplant engineer.

"Champion's close cooperation and efforts to constantly improve their product point up the fact that we're receiving the finest spark plug in the field," R. D. Charles, assistant Overhaul superintendent and a 27-year PAA veteran, tells Fisher.

A. S. Galbraith, Division Supply Manager, LAD-PAA "Cost, quality and service life determine produc selection. All three factors apply to Champions."

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

# Policy for Air Space

*The part NBAA plays in representing business aviation in governmental fields covers many areas. One of these is the Air Space Panel of the Air Coordinating Committee, top agency for aviation policy. This article, the first of a series, explains how the Air Space Panel works and its importance to NBAA members as users of the national air-space.*

By Richard W. Groux
Assistant to the
Executive Director of NBAA

As you fly along the nation's skyways in your business aircraft have you ever tried to explain to yourself how and why it has become a complicated matter to file a flight plan that did not involve "dog legs" . . . or find an approach plate that showed no tall obstructions surrounding the airport . . . **or a major** airport that didn't have traffic conflicts with other airports?

Dig out an airways chart that's five years old . . . one that covers the New York to Chicago route. Compare it with the latest version. Lots of changes; plenty of new routes are shown!

Who made these changes? Why were they made? And what is being done to straighten out some of the existing hazards?

Aviation growth after World War II was so rapid that it outstripped the administrative processes of the various federal governmental agencies to deal with important aviation problems effectively.

So, in September 1946, the President, by Executive Order, established the Air Coordinating Committee. The purpose of the Air Coordinating Committee is to act as an administrative mechanism to assure full coordination of the Government's aviation policies among the nine separate departments and agencies which exercise major governmental responsibility.

Our immediate concern now turns to what is known as the Air Space Panel of the Air Coordinating Committee. This Panel, with its eight Regional Subcommittees, is the primary coordinating component of the Federal Government in regard to specific and current airspace problems involving air navigation aids; airports; airways; prohibited, restricted and warning areas, and obstruction to air navigation.

The Air Space Panel is composed of six voting members: the Departments of Commerce, Army, Navy, Air Force, the CAB and the FCC. In addition, organizations such as NBAA, representing either a substantial segment of the aviation industry or a substantial portion of the users of airspace, are allowed non-voting membership. They act as expert advisors in their particular fields. The members of the Panel understand that they are serving not only their own agencies, but the entire Executive branch of the government as well: the recommendations of the Panel and its Subcommittees are made for the national welfare.

Specific air-space problems are considered initially in one of the regional Subcommittees, composed of local representatives of the agencies and organizations interested.

The Regional Subcommittees meet once every four to seven weeks. The recommendations from the Regional Subcommittees are forwarded for approval to the Air Space Panel, which meets regularly in Washington. During 1956, the Panel and its Subcommittees considered 3,328 separate problems and arrived at acceptable solutions on all but four cases which involved matters of policy.

One of the many responsibilities of the Panel is to make recommendations to the Federal Communications Commission on the aeronautical implications of proposed radio and television antenna towers.

Since coverage by a broadcast station is closely related to its height, problems often arise from the desire of broadcasters for taller towers and the objections to such towers by aviation interests.

The Panel reviews all tower proposals which exceed the planes of a criteria previously established for this purpose. In some cases the Panel undertakes to suggest a height and a site for a tower, which it feels would be satisfactory to both the broadcasting and aeronautical interests concerned. Twelve hundred and sixteen tower cases were acted on in 1956.

A recent tall tower case will illustrate how the Panel operates.

On February 28th, 1956, a proposal was received by the New York Regional Subcommittee from the Federal Communications Commission, requesting that an aeronautical analysis be conducted to determine if a proposed tower near Louisville, Kentucky, would be acceptable to aviation.

On January 17, 1956, a request was received by the Subcommittee to approve a tower site and the construction of a tower 2003 feet above ground, and 2,673 feet above mean sea level, about sixteen miles southeast of the center of Louisville.

The Louisville station requesting the site and tower presented to the Subcommittee a very comprehensive study of the affect such a tower would have on aviation. The station also agreed to bear the cost of the relocation and orientation of various air navigation aids which would have to be moved.

Because the Tower would incur too many penalties to aviation at this site and height, regardless of relocation of navigational aids, the subcommittee disapproved the request.

Further objections to the proposed tower were registered by interested local and national civil aviation organizations.

The case was then referred to the Washington Air Space Panel for further action. The broadcaster appeared before the Panel to present his request. He explained that a tower of this height was desired to improve the station's television signal in Kentucky and southern Indiana. The Airspace Panel indicated that it had advised the applicant that a site in the "antenna farm area" northwest of Louisville, would be preferable to aviation, especially since there was an existing tower of 1,590 feet above mean sea level in that area. Or, if this location was not possible, a site further to the southeast, outside of the airway complex and more distant from the airports, would be better.

The applicant indicated that the northwest location would be unacceptable because the tower would be situated across the Ohio river. This would place it in the Federal Communication Commission's Zone 1, where tower heights are limited to 1,000 feet above average terrain. The requested site was in Zone 2, which from a transmitting standpoint would allow a tower height of 2,000 feet.

A new proposal was then submitted by the applicant to locate the tower somewhat further to the southeast of the site requested. This new site would put it in the neighborhood of Mt. Washington, Kentucky. Even so, the tower, having a height of 2,003 feet, or 2,743 feet above mean sea level would still be within the airways complex.

The Panel decided that such a high tower would extensively affect enroute and terminal operations; that approval of the request would mean higher minimum enroute altitudes, including cardinal air traffic control altitudes, on five Victor airways. Procedure turn altitudes would have to be increased. Victor 4 and Victor 5 airways would have to be realigned. The southeast quadrant was shown to have the greatest concentration of aerial traffic. A high tower at that site would adversely affect traffic flow at Bowman and Standiford Field.

The Panel disapproved the request.

On August 21, 1956, the applicant notified the Panel that he was unable to locate to the northwest and requested approval of a lower tower near the same site. The tower now requested was to be 1,799 feet, or 2,549 feet above mean sea level. The Panel notified the applicant that this request would have the same aeronautical affect and would have to be disapproved.

On October 11, 1956, in answer to a request from the Federal Communications Commission, the Panel agreed that a tower with a maximum height of about 1,300 feet would be the highest aviation could accept in that area. To date, no further action has been

(*Continued on page* 45)

# MAINTENANCE

## Excerpts from Pratt & Whitney Engine Maintenance Forum

The following are excerpts from the minutes of the Pratt & Whitney Engine Maintenance Forum held recently in Berkeley, Calif.:

**P & W -985 Engines:**

Twin-Beech owners have reported some trouble with oil dripping. The reason is that the valve guide clearances are high. This causes a slight oil drip when the aircraft is parked.

Suggested cure made by P & W engineers was to set valve clearances to .030 *hot,* and use 80/87 grade fuel. 90/98 fuel is more highly leaded and, besides, costs two cents more per gal.

Beech owners should check with the company if their hp calculators do not agree with P & W calculators. CAA certification and Beech demonstration flights were and are run with 91 octane fuel, but use of 80/87 is approved and no significant ill effects have been noted.

(There's been some speculation that P & W is going to produce a new -985, but the company claims it has no such intentions.)

Some owners have reported that the cylinder-heads have worked loose.

This is, in reality, a barrel oil leak from newly-overhauled engines. It is the lubricant which is used to seal the head and the barrel. It looks like an oil leak, but with continued operation of the engine it cooks and disappears.

The time elapsing between overhauls on the -985 engine is elastic. As a rough rule of thumb, operators have found 800-1000 hrs. a good yardstick.

At overhaul, it is recommended that crankshafts be *reworked,* due to occasionally poor subcontracting during the war.

(According to P & W engineers, any 100-grade oil is satisfactory.)

**R-1830 Engines** (on DC-3, Lockheed, etc.):

These parts are rapidly drying up, and, though P & W is committed to support the owners, it may require a year's wait. So order early!

Lubricating oil filtration as opposed to oil filters was discussed. The filters look good for engine reliability, and both Southwest Airways and PanAm have done research. They may be contacted for more information. (On a 100-hr. test, one operator found it most practicable to replace oil filter cartridge after this period.)

All pilots were reminded *never to let down with less than 1-inch of manifold pressure for every 100 rpm,* because of the loading on the master rods. *(On Stretching the Glide:* One company reported that it owned a surplus DC-3 which had been used for glider towing. Over-all length now measures 6-inches longer than specified!)

**R-2800 Engines** (Convairs; Venturas, etc.):

The removal of creeper gears on the R-2800-B was tested by United Air Lines into a constant bleed. The tests indicated that the constant bleed is not the answer to preventing "sludge."

Experts on the P & W Panel were: Morris Triggs; Lionel Clark, moderator; Walter J. Cake; John D. Frazee; M. J. Saunders; George T. Keller, and John C. Steel.

## Use of Signal Generator in Checking Receiver Sensitivity

A recent service bulletin from NARCO concerning testing of VHF receivers contained the following important points:

"A relatively new service problem has begun to rear its ugly head in the various aircraft service shops throughout the country. This problem has to do with the bench testing of VHF receivers that provide for 50 KC spacing.

"When using a VHF signal generator, modulated at 1000 cycles per second, it has been observed that some of the test equipments currently in service actually supply a VHF signal not only amplitude modulated at 1000 cycles per second, but also frequency modulated at the same rate. This frequency modulation is thus slope detected by virtue of steep slopes of the IF curve, and because of the high amplitude modulation resulting from this steep curve the detected audio output is very high.

"This phenomenon is a characteristic of all receivers properly designed for 50 KC channel separation. One possible solution to bench checking receivers with signal generators that are subject to frequency modulation as well as amplitude modulation, is to check the receiver sensitivity independently of the audio amplifier section gain. This would entail the use of an unmodulated RF signal." *(For more detailed information, see NARCO Service Bulletin #3018.)*

## Stic-Klip Has New Size Clip

The Stic-Klip Mfg. Co. has added a 3/8-inch tubing-spring-clip to its line.

These clips are designed to hold wiring, cable, hose, flexible metal tubing, etc. to ducts and surfaces. The new size makes possible the use of larger diameter wiring and tubing materials faster, and without drilling or punching metal surfaces.

## Fuel Resistant Reinforced Seals Produced by Conn. Hard Rubber

Fuel resistant, fabric-covered, fabric-reinforced seals for –65° F. to 400° F. are being produced by Connecticut Hard Rubber Co.

The seals provide high tear-and-abrasion resistance, remain resilient and resist swelling and destruction by aviation fuel and oils.

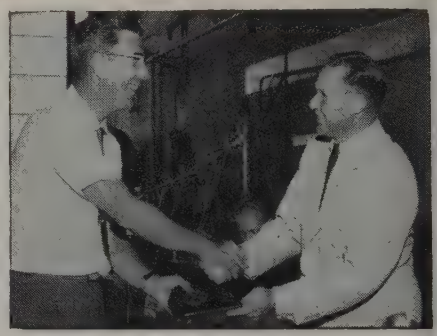
The seals are already being made for use as airframe seals.

## Nat'l Dairies' DC-3, Rip Strong, Take Top Honors at the Reading Maintenance & Operations Show

The DC-3 of National Dairies (NBAA member) was designated "Flagship of the U.S. Industrial Fleet" at Reading Aviation's Eighth Annual Maintenance and Operations Meeting, June 1. National Dairies' chief pilot, Rip Strong, received the award on behalf of his firm.

Thousands of aviation enthusiasts, participants and spectators, crowded RAS' hangars for the meeting and show.

One smartly-decorated hangar housed the many maintenance-safety display booths and the morning's panel discussion. Another building served as a dining hall, where the crowds were served a lavish luncheon (complete with turtle-soup).



*Rip Strong, chief pilot for Nat'l Dairies (NBAA member), accepts award from "Sime" Bertolet, president of RAS, as his Co.'s DC-3 becomes "Flagship" of industl. fleet.*

Attendance at the morning meeting was excellent, with a number of well-directed questions being shot at the speakers at the end of the forum.

The guests had ample opportunity to visit the displays presented by Cessna; Pratt & Whitney; Air Associates, and many others, during the lunch period. The break also gave them a chance to look over the many aircraft competing for the Reading Aviation Awards.

"Sime" Bertolet, RAS President, welcomed the gathering and Jerry Lederer, FSF, as Chairman, introduced the speakers. Randy Carpenter, FSF, urged business pilots to establish proficiency standards. Bob Buck, TWA Captain related early experiences paralleling today's business flying. Joe Chase for FSF spoke of the value of "manualizing" maintenance. For CAA, John Wilson, N Y Center and Art Graham, LGA Tower, made suggestions for easier ATC handling in hi-density areas.

Judges for the RAS Awards were inspecting competing aircraft during the proceedings, in preparation for the awards presentation, which was made at 1530.

Highlight of the awards was the designation of the "Flagship of the U.S. Industrial Fleet." With George Haddaway acting as m.c., the remainder of the awards were as follows:

In the *single-engine* category, winners were: Gerald Cassel's Piper PA-12, best exterior, and Ed Chatterton's Cessna 182, which won the best interior, best equipped and best-of-class awards.

In the *twin-engine (under 5000 lbs.)* category, awards went to: RCA of Camden, N.J., Cessna 310, best exterior (pilot, Richard Whempner), and the Cessna 310 belonging to Ed Chatterton, for best interior, best equipped and best-of-class.

In the *twin-engine (5000-12,000 lb. class):* Lukens Steel Co., Aero Commander Super 680 (Bill Austin, pilot), best exterior; and James Harrison's Aero Commander 680, (Wm. R. Brand, pilot) best interior, best equipped and best-of-class.

*Twin-engine (over 12,000 lbs.)* winners were: Nat'l. Dairies, DC-3 (Rip Strong, pilot), best exterior; Huessler Aviation, DC-3 (Jack Prior, pilot), best interior; Fairways, Inc., Convair 440 (Geo. Young, pilot), best equipped, and Nat'l. Dairies DC-3, (Rip Strong, pilot) best-of-class.

Laurels for the best *antique airplane* were split between Capt. R. V. Talbott and his Brunner-Winkle-Bird, and Ernest H. Buehl with his OX-5-powered KR-31.

Perhaps the highpoint of the entire presentation was the award made to the craft designated as *"Flagship of the Business Fleet."* This prize went to Nat'l. Dairies' DC-3, and its pilot, Wm. R. (Rip) Strong. Strong is shown receiving his award from "Sime" Bertolet, Reading Av.'s president, in the accompanying photograph.

George Haddaway presided.

The full substance of the panel discussion will be published in the August issue for the benefit of those who did not attend the meeting. This will take the place of the usual SKYWAYS Round Table.

## Bulletin of Buffet Unit Connectors Offered by Cannon

The Cannon Electric Co., 3208 Humboldt St., Los Angeles, is now offering an 8-page bulletin containing information on buffet-unit connectors. These are primarily for aircraft using frozen food cases, aircraft galleys and other buffet units.

The bulletin shows 13 types of unit connectors with from two to six contacts.

# . . . . in the business hangar

■ **Van's Air Service, Inc.,** Winona, Minn., has run a 100-hr. inspection on Ray-O-Vac Co.'s Aero Commander (Bill Allen, pilot). ☐ Has also done radio work on Giddings & Lewis Machine Tool Co.'s Lodestar (Doug Lionberger, chief pilot) and J. R. Watkins Co.'s DC-3 and Cessna 310 (Jack Ollom, chief pilot). These firms are all NBAA members. ☐ Annuals have been run on the Aero Commander and Navion of Dekalk Agricultural Assn., and the Navions of John Hassler, Iron Mt., Mich.; Henry Hoffman, Grafton, N. Dakota, and Joe O'Neil, Minneapolis, Minn. ☐ Major repairs were made on the Navions of Albrecht & Eckhoff, of Iowa City, and the Minnesota State Dept. of Aeronautics.

■ **Southwest Airmotive Co.,** Dallas, did a double engine change and overhaul on Codell Construction Co.'s 560 Aero Commander (E. F. Kinnaird, Jr., chief pilot). ☐ Shamrock Oil & Gas' D18S Beech was brought in for miscellaneous work by pilot Tom Smith. ☐ Luis Salinas, F. S., brought La Consolidada's B-50 Bonanza from Mexico City for an engine change. ☐ Cummins Engine's DC-3 was brought to SAC for a 100-hr. inspection by pilots Bill Pruner and

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# . . . . in the business hangar

Phil Kaufeld. ☐ A double engine change and miscellaneous work was done on Kerr McGee Oil Co.'s DC-3 (Ken Hunter, pilot). ☐ Jim Sinex, pilot for Trice Productions, brought his D18S in for miscellaneous work. ☐ Chief pilot Jimmy Boyd of Shamrock Oil brought his firm's Lodestar in for a 100-hr. inspection. ☐ Gene Autry's D18S was brought to SAC by pilot Herb Green for double engine change.

■ **PacAero,** Santa Monica, Calif. has completed the first 100-hr. inspection of Sangamo Electric Co.'s #1 Learstar Mark II. The firm has also placed its order for a second Mark II. U.S. Steel has had one of their Lodestars modified to include the Learstar Heating System; Learstar floor structure and floorboard system; short stack exhaust system with new, specially developed carburetor heat-muffs. U.S. Steel also operates 3 Learstar Mark I airplanes. Don Teel is chief pilot. ☐ Texas Eastern Transmission Corp.'s Lodestar has been brought in for an 8000-hr. overhaul, interior rework and conversion to a Learstar Mark II. Jim Ketner, Jr., is chief pilot. ☐ Warren Petroleum Corp.'s Learstar Mark II is in for installation of Bendix C Band Weather Radar and Dual Collins DF-201 ADF system. ☐ Capt. Bill Faulds brought the Harold S. Vanderbilt Learstar in for an annual inspection, installation of fillets and new-style electrical carburetor heat controls. ☐ Gillet's Learstar was in for minor modifications. H. E. Wood is chief pilot.

■ **American Airmotive's** president, Charles E. Lewis, has broken ground for a $2-million full-cantilever hangar to be completed this year. ☐ First installation in an exec aircraft of a Collins DF-201 ADF was made by Amairco on H. S. Vanderbilt's Learstar—Bill Faulds, pilot. A custom radio panel modification was made to incorporate the DF-201 control head. ☐ Nat'l. Dairy Products Corp.'s DC-3 sports a new exterior paint job and newly-recovered control surfaces, done by Amairco. Pilot Rip Strong and co-pilot Pete Hellebrant supervised this work. ☐ The Cappel-MacDonald Co.'s Lodestar has just had a 100-hr. inspection, plus an engine change and installation of a 618-S Collins HF transceiver. Chief pilot Jack de Wolfe and pilot Jim Hondorf supervised the work. ☐ Trans-Caribbean Airways' DC-4 is in Amairco's hangar, in final stages of a 10,000-hr. overhaul, complete with engine change, cabin interior rejuvenation, new exterior paint job and installation of a 618-S Collins HF transceiver. Charles Sudarno is supervising.

■ **Capitol Aviation, Inc.,** Springfield, Ill., has just completed a 100-hr. inspection of Kroehler Mfg. Co.'s Lodestar. ☐ Sangamo Electric's Lodestar was given a double engine-change, and the firm's Learstar has been put on a progressive inspection system by Capitol. ☐ A periodic inspection was recently completed on Central Illinois Public Service's Cessna 310, and on R. B. Potasnick's Lodestar. ☐ A 100-hr. inspection was accomplished on State of Illinois Highway's Cessna 310. ☐ A Mark II and Arcon auto pilot were installed in Mr. Bernhard's new Cessna 182.

■ Latest installations of **Lear** equipment throughout the nation are as follows: Sky Harbor Air Service, Cheyenne, Wyo., installed Lear DM LTRA-6 in Cessna 172's owned by Dr. Eugene Pelton of Laramie, C. W. Amis, Omaha, and Hastings Skyways, Hastings, Neb.; and in the 182 of Max Krueger, of Laramie. Sky Harbor also equipped the 182 of Dr. James D. Hennessy, Council Bluffs, Ia., with Lear ADF-12E. ☐ Skyways, Inc., Troutdale, Ore., has completed installation of Lear ADF-12E, LTRA-6 DM, RT-10E and Arcon in the Cessna 182 of Cascade Broadcasting Co., Yakima, Wash. (Jack Everhart, pilot). The following Lear installations are in progress at Skyways: LTR-800 and ADF-100 in Pacific Power & Light's DC-3, and LTRA-6 DM, LTR-6 and ADF-12E in Dwyer Lumber Co.'s Cessna 180. ☐ Huntair, Inc., San Diego, has installed ADF-12E and LTRA-6T (with Omni) in Electro Instrument's Cessna 182. Huntair is also installing Lear ADF-12E in Service Novelty Co.'s 182. ☐ Southwestern Skyways, Ogden, Utah, has added a Lear RT-10 to Dr. Charles Parmalee's Cessna 182. ☐ Aircraftsmen, Inc., Oklahoma City, installed

(*Continued on page* 40)


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## Grand Central's New Facility Ready at Van Nuys, Calif.

Designed to provide services for the repair and overhaul of DC-3, A-26, B-25, Lodestar, Convair 240 and all single-engine piston-powered and jet trainers, Grand Central Aircraft Co.'s new facility at Van Nuys is being pushed for an opening prior to July 1, '57.

Grand Central has increased its Glendale facilities by an additional 500,000 sq. ft. of floor space, ramp and flight line area. The property is adjacent to (and has access to) a 6000' runway. Los Angeles has plans to increase the existing runway to 8000', plus a parallel runway and other improvements.

Three buildings, representing 40,000 sq. ft. of production space, are currently being refurbished preparatory to installing machinery, equipment and ground handling facilities. Hand tools, supplies and machinery are being delivered daily to Van Nuys; specialized machinery and equipment will be assigned as needed. The facility includes a 6000 sq. ft. concrete slab wash rack, and a contract is being let to resurface a large portion of the ramp.

Personnel have been transferred to the new facility, providing maintenance services such as minor repairs, fuel and oil sales, servicing, and tie-down and storage. They are now engaged in the overhaul and repair of a C-47A.

All activities conducted at the Van Nuys installation will be under the direct management of Glendale, and will operate as part of Grand Central Aircraft Co., CAA repair station certificate #75.

## Phila.'s Central Aero Starts Intensive Delivery Service

Central Aero Supply, Inc., at North Phila. Airport, has begun a twice-a-week truck delivery service to all airports within 25 miles of Phila.

New service will facilitate bulky deliveries, and free planes for service to more distant aircraft maintenance shops.

## Twin Cities' Citizens Battle Expansion of Wold-Chamberlain

The Citizens Air Safety League of Minneapolis and St. Paul, Minnesota, is fighting hard to prevent expenditure of additional money on expanding Wold-Chamberlain field for jet operations in their area.

The group points out that the field is already obsolete, in view of the needs of commercial jets. It also cites many ways in which the field, placed where it is, would harm the community in general.

They strongly recommend applying the funds to development of an entirely new and more appropriate facility less than 18 miles from the Twin Cities.

The CASL bases a number of its objections on the Doolittle Report, prepared in 1952, which is a study of airports in relation to surrounding communities.

## Alouette II, French Jet 'Copter, Introduced to U. S. by Republic

The Alouette II, jet-powered helicopter built by Sud Aviation of France, recently toured the U. S. under the auspices of Republic Aviation, who is licensed to manufacture the craft in this country.

Herb Fisher, chief of Port of New York Authority's Aviation Development Div., flight-tested the Alouette II, evaluating it for possible business use. (M. I. Peale, president of Republic Aviation, is shown pointing out some of the Alouette's operating advantages to Herb Fisher—center—as Ken Ellington, Republic vp, looks over their shoulders.)

It is now in wide use in Europe, for rescue work in the Alps, because of its excellent performance at high altitude and low temperature.

Powerplant is the Turbomeca Artouste II fixed-turbine engine, which develops 360 hp at takeoff with a continuous performance rating of 325 hp.

Outstanding characteristics of the Alouette II are: no warm-up period for engine; instant takeoff; efficient performance at high alt. and low temps., and no engine vibration.

Herb Fisher (see below, flying the Alouette II with Gerard Henry, Sud Aviation's test pilot) said about the French whirly-bird: "It's the easiest helicopter to fly that I've ever been in.

"It's a highly maneuverable craft, but very stable. And one of the best things about it is the simplicity of its control system."

## Slick Offers 7 DC-4's for Sale

Seven DC-4 aircraft are being offered for sale, as a fleet or individually, by Slick Airways.

The DC-4's are no longer needed by the carrier, due to acquisition of some DC-6A's.

Four of the DC-4's are cargo craft, the other three having convertible interiors, fully equipped for passenger operation.

All the craft may be seen in this country.

## Cessna Sales Zoom

Cessna Aircraft Co.'s sales have spurted ahead. The firm's April sales were 235 business airplanes.

Even larger sales are anticipated, with 172's and 182's the most popular aircraft.

Export business has also increased, with 55 airplanes exported to 16 countries during last April.

## Wilmington Jaycee "Aerorama" Set

Wilmington Jaycee's air show, "Aerorama," has been scheduled for October 12-13, 1957, at New Castle Airport.

Exhibitors are now being invited to participate. Special invitations are being extended to large concerns in the area. 70% of displays are expected to be of aviation and allied fields.

## Fairchild F-27 Equipped with Goodyear Brakes and Wheels

Fairchild's "Friendship," short-and medium-range propjet transport, has been equipped with Tri-Metallic disc brakes and cast wheels by Goodyear Tire and Rubber Co.

Designed to augment the F-27's short-field capabilities, disc-brake has greater heat absorption and fewer parts than comparable brakes.

The first F-27 is scheduled to be delivered in October.

## CAA Offers Four Planning Books

Four publications, which contain CAA's principle planning tools, are being offered to the aviation public. The data contained therein are useful as guides to aviation business firms in gauging the market for future planning.

The annual "Statistical Handbook of Civil Aviation" reports such items as: federal aid to airports; volume of *business* aircraft travel; record of air accidents, and many other facts and figures. (U.S. Govt. Printing Office, $.55)

"The Air Commerce Traffic Pattern," prepared by CAA's Office of Airports, gives statistics on volume of passengers carried, and volume of mail and cargo at airports with scheduled air service. (Dept. of Commerce, Sales and Distrib. Branch, $.50)

"Federal Airways Air Traffic Activity" is a "tool" for planning CAA's services along the airways. Material is limited to a listing of fix postings, flight plans filed, number of operations handled at control towers and centers, etc. (Commerce Dept., $.50)

The newest publication is "1960, 1965, 1970 Civil Aviation and Federal Airways Forecasts." Prepared by the Program Planning Office, it uses past statistics to predict future developments. (Dept. of Commerce, $.75)

## Helio Strato-Courier Operates As High-Flying Industrial Craft

The Strato-Cruiser, a special-purpose aircraft designed by Helio Aircraft Corp., is reported to have some remarkable characteristics.

With a supercharged 340 hp geared Lycoming engine, the new model operates as an industrial airplane under C.A.R. 8 at *over 30,000 feet.*

Other performance characteristics include: full-control slow flight at 30 mph; sea-level climb rate over 2000 fpm; maximum speed 194 mph with a cruise of 182. Maximum still-air range is over 1000 miles.

Strato-Courier's prime use is as a photographic aircraft.

## Engine-Leasing Contract Signed By Slick and Pacific Airmotive

A five-year contract covering the leasing of aircraft engines to power Slick Airways' new DC-6A freighters has been announced by Henry P. Huff, v.p. of Operations and Maintenance for Slick, and Roy Backman, Pacific Airmotive Corp. v.p.

The engines will be supplied by Pioneer Aircraft Leasing Corp., a PAC subsidiary.

Twenty-four R2800-CB engines are involved in the deal, which, according to Mr. Backman, "represent an investment in excess of $1-million." Periodic overhaul will be done in PAC's Burbank, Calif. engine shop.

## Florida Purchasing Agents Airlifted to Miami Exposition

An outstanding feature of the recent Greater Miami Industrial Exposition was the "airlifting" of a group of purchasing agents from 10 major Florida aviation interests, to Miami, for conferences.

Two groups were brought in by L.B. Smith Aircraft Co., from St. Petersburg and Orlando.

After conferring with local firms' representatives, the agents were flown back to their locales.

The impact of the flight was considerable; it received extensive television and press coverage.

## Steam-Cleaning Detergent Offered

Oakite Products, Inc., has announced the development of Oakite LSD, a new liquid detergent for use in steam-cleaning equipment.

The detergent is said to provide effective soil removal at concentrations of 1-2 oz. per gal. of water. It is claimed to be safe on steel, brass, magnesium and painted surfaces.

## Portable Spray Painter Offered

Described as a tool for high-performance professional spray jobs at low cost, the "Twin Tuffy" is a new portable spray painting unit offered by the DeVilbiss Co.

It weighs 59 lbs. and is equipped with a ½-hp electric motor which runs 2¼-hp compressors. Actual delivery is 4.6 to 5 cu. ft. of air per minute.

## Piper Delivers 1000th Apache

Piper Aircraft Corp. delivered its 1000th twin-engine Apache recently.

Dr. and Mrs. T. J. Gamble, Encino, Calif., flew in to Lock Haven, Pa., to take delivery of the aircraft.

Apaches are currently being made at a rate of two each day.

*(Dr. and Mrs. Gamble are seen shaking hands with J. W. Miller, Piper Genl. Sales Mgr., in accompanying photo.)*

## Special Service Frequencies Expanded to Meet Business Need

As a result of a request by NBAA, the FCC is making available to private and business aircraft a second "special service" frequency.

The new frequency, 123.0 mc, is now available for communications between private aircraft and aeronautical advisory stations at landing areas served by airdrome control stations.

Also, effective July 5, 1957, the current Unicom frequency, 122.8 mc, may be used by air-carrier aircraft weighing less than 10,000 lbs. (air-taxi, charter, feeder airlines, etc.). The frequency will continue to function for aeronautical advisory stations at non-control airports.

The overall scope of aeronautical advisory service is being expanded at the same time, to include "special service communication"; that is, those concerning "efficient portal-to-portal transit of which the flight is a part" (such as availibility of food, lodging, aircraft service, surface transport, etc.).

## No Room for Errors, Medics Say

There is no margin for error in the fast airplane flights which are coming, The Aero Medical Association was told in Denver.

"Things happen too fast," explained Dr. Charles I. Barron of Burbank.

Even discord at home can prove very dangerous in the cockpit, was the opinion of Dr. Howard K. Edwards of Miami. He stated that, in the jet age, a closer physical and psychological check will have to be made of the pilots flying aircraft.

## Improvements for Willow Run Airport

The Regents of the University of Michigan have approved a schedule of improvements for Willow Run Airport, if Federal and state funds are forthcoming.

Included in the projected changes are: extension of instrument runway by 800 feet to accomodate commercial jets; asphalt resurfacing of one runway and other sections of field; conversion of all runway lights to elevated-type lights, and clearing of air-approaches to two runways, including instrument runway.

## Washington State's Emergency Fields Are Usable; New One to be Added

The seven emergency airfields in Washington State have come through the winter in good condition, reports Robt. L. Nuber, state director of Aeronautics.

Caution is recommended in using these fields, as some of them are still soft.

Arrangements are now being made for summer maintenance. A new field at Easton, Wash., will be added to the seven now located at Skykomish; Nason Creek; Lake Wenatchee; Bandera; Lester; Packwood and Tieton, Washington.

## Martin Offers New Portable Jet Noise Suppressor

The impending use of jet aircraft in business operations continues to be plagued by the spectre of noise. As in the case of the New York metropolitan airports where the Port of N. Y. Authority has so far banned jet activities, business operators cannot afford to limit their scope to industrial areas or communities raising no such barriers.

Conversely, commercial aircraft service bases who will want the business of servicing these non-airline aircraft, will have to provide the special facili-

ties required for their operation.

Hence, the announcement by the Martin Co. of a low-cost, portable jet engine muffler, designed to reduce noise of jets at airports, is of considerable interest.

The new muffler has proven effective in holding down noise of jet run-ups on a number of aircraft, according to a company official.

The muffler varies in price from $500 to $10,000, depending on the aircraft it is intended for.

## A Notice from USAF's ARDC

The Air Force's Air Research and Development Command has issued a notice to the following effect:

A company known as Federal Procurement Publications, Inc., in Long Island City, N. Y., is issuing a booklet called "94-Page Special Report Booklet" on the ARDC, to be sold at $25 per copy.

ARDC advises that it has no connection with this concern, knows nothing about it, and has not supplied any data for the book. It therefore declines any responsibility "for the accuracy and currency of the information about the Command and its Centers which is to be included in the 'Special Report.'"

## "Green Hornet" Pilots See Better

The "Green Hornet," Garrett Corp.'s DC-3, has new, greatly improved visibility.

Garrett's Aviation Service Div. installed an extra 1200 sq. inches of lucite *above* the pilot's compartment in three panels, adding an estimated 150% to visibility. Center panel doubles as escape hatch.

## Free Film on Aluminum Finishing

Turco Products, Inc., is making a 15-minute full-color sound film available to industrial firms and other interested groups, titled "Aluminum Finishing."

The film was made during production of aircraft fuel tanks, and demonstrates every aspect of aluminum finishing, including painting and how paint is made to stick.

## Commercial Version of Vertol H-21 Helicopter Now Available

The Vertol Aircraft Corp. has announced the availability of the Vertol 44, an advanced, commercial version of the firm's H-21 military helicopter.

The 44 was certified by the CAA and Canadian Dept. of Transport recently. It is available in three versions: utility cargo (over 2½-ton useful load); a 15-19 seat airline version, and a 10-passenger executive version.

## Midwest Div. of SAC Approved

The Midwest Div. of Southwest Airmotive Co., at Kansas City, Kans., has received CAA certification for repair of instruments and accessories.

## Longer Runway at Boeing Field

Dayton Witten, Field Manager at Boeing Field, Washington, has indicated that the short runway of 1800 feet there will soon be lengthened to 2900 feet.

## Planes Shown at Business Aid Show

The Norman Larson Co., Calif. and Nev. distributor of Beechcraft, established a "first" by having two display booths at the National Sales Executive Business Aids Show in L.A. last month.

The Larson displays featured a full-scale mock-up of a Beech interior and instrument panel, as well as engines, radio equipment and instruments.

This is another indication that corporate aircraft are taking their place as effective "sales aids."

## Van Dusen Opens Miami Division

Van Dusen Aircraft Supplies, Teterboro, N. J., has opened a new branch at Miami Springs, Fla.

A. G. Bari, formerly manager of Air Associates, Inc.'s Miami branch, is the manager of the new Van Dusen outlet.

Opening Date was July 1 for the offices, showroom and warehouse, near Miami's Int'l. Airport.

## WEST COAST NEWS

**Jobmaster Co.,** Seattle, has a rework program for the Howard pre-World War II business aircraft. They will modify it to a DGA-15P floatplane by increasing seating to six, metallizing fuselage and adding an extra cargo door.

**The Spokane** Chamber of Commerce and Business Pilots Assoc. sponsored a Flight Clinic June 2, which was well attended.

**The Annual Aviation Week** at Wenatchee, Wash., included a flight clinic for executive pilots. It was held June 3-9.

**Stanford University,** Stanford, Calif., will hold its **Transportation Management Program** July 20-23.

At the latest Regional Airspace meeting, proposed VOR radio range installations were approved for Drake, Ariz., and St. Johns, Ariz.

Another was approved for Goffs, Calif.

Pilots are cautioned that the **Las Vegas** VOR radio range will be relocated soon.

The **Riverside, Calif. LF radio range south course** will be swung 10 degrees, from 339° to 329° magnetic toward the station.

**Exec pilots flying in Southwest U.S.** are cautioned that very shortly there will be manned-balloon flights in the New Mexico area, as well as target-balloon and research-balloon flights.

**Beech Aircraft's** award-winning **Service Clinic** held court recently at the Norman Larson Co., Van Nuys, Calif. Over 100 Beechcraft owners flew in for the comprehensive free maintenance inspection.

The Clinic then moved on to the Martin School of Aviation, Santa Ana, and then on to Fresno.

Beech Aircraft will have completely integrated testing, research and development, and production facilities for specialized aircraft articles at its Boulder, Colo. plant, which has been elevated to Division status, with R. B. Bosworth as manager.

## Suite 344

(*Continued from page* 10)

relations with all air-space users.

NBAA was invited to participate in a flight of the new French jet, the *Caravelle*. Dick Groux enjoyed the hour-long demonstration flight. He found it to be a low slung aircraft with very clean lines. Passenger loading was accomplished through the aft section. The interior was attractively appointed, with orange, rust and tan the predominating colors. After starting and until altitude was reached the noise level was quite low, except in the aft portion during take-off. Positive acceleration was felt throughout the take-off roll and the aircraft broke clean in a fairly high angle of attack which was sustained throughout the climb. Although it was a very warm day at National Airport, temperature around 87° with a 15-knot, 25-degree crosswind blowing, the aircraft was off about 800 feet before some of the "Connies" that had preceded it.

The ventilating system created enough noise to be annoying. During the letdown Dick was on the flight deck as an interested observer. The craft was very stable throughout the various maneuvers except when the spoilers on the wings were engaged and then a slight buffeting was experienced. Unfortunately, the flight visibility from the cockpit was *very limited*, especially to the side. The landing was well executed, with the aircraft smoothly placed on the runway without any sense of "pay-off." Braking, while applied almost immediately, was not extreme and the turn off from the active was made with plenty of runway to spare. Good champagne, melodious French songs, and a pair of lovely attendants rounded out the impressions of a very pleasant flight.

"C. M."

**Mile-high City of Denver hosts NBAA Annual Forum Oct. 2, 3, 4.**

# V. I. P. Flight, Washington, D.C.

*This story about the Heron operated by the British Joint Services Mission in the U. S. will, we believe, be of interest to our readers. It is reprinted by kind permission of the Editors of* Flight Deck, *Fleet Air Arm quarterly and the* DeHavilland Gazette.

The deHavilland Heron 2 allotted to the British Joint Services Mission in Washington has just completed its first full year of operation. Flown by either the RAF Flight Cmdr. or the Flag Lieut. to the Admiral, it has covered 155,000 passenger mi., has never failed to make a planned trip, and has seldom failed to keep an exact E.T.A.

The Heron—in RAF colors and fitted out as an Executive version, the 8 passenger seats facing each other in pairs, with folding tables in between—arrived Nov., 1954, and spent the next 2 months in a hangar at Washington National Airport while a number of American radio aids were installed by a civilian contractor.

Early in 1955 the Heron was moved to its permanent home, Andrews AFB, Md., where facilities are provided by the courtesy of the U. S. Air Force.

Of the 436 hrs. flown during 1955, only 60 were for training and proficiency flying, and these were mainly available during the first 6 mo. Since then V.I.P. utilization has risen so sharply that all other flying is almost totally excluded. With three Naval and 12 RAF pilots in the Mission, it can readily be appreciated that the Heron is unable to meet the requirements to provide proficiency flying.

The Heron has operated from airfields in 34 of the 48 states, much of Eastern Canada and the West Indies, and the only 2 occasions on which trips have been delayed were due entirely to snow on the Heron or on the runways. After the failure of an engine at Maxwell AFB recently, a takeoff *on 3 engines* enabled the program to continue without interruption.

The Heron lives in the open all the year around, and this exposure does not seem to have affected serviceability or to have increased maintenance problems unduly. Inspections are based on flying hrs. resulting in the need for a very careful forward planning of the program, and the aircraft must often be grounded to conserve hours for some important flight. In addition to daily inspections, a Primary 2-star must be carried out every 50 hrs., a Minor every 150 and a Major at 600; these take 3, 8 and 30 working days respectively.

"Maintenance is in the hands of one R.A.F. Sergeant, who flies everywhere in the Heron, and a generous supply of spares is always carried so that on-the-spot repairs can be made if necessary. Spare parts have been provided in adequate quantities, and technical advice has always been available from de-Havilland in New York. An R.A.F. Corporal has recently joined the maintenance crew.

"The cockpit of the Heron is essentially similar to that of the Dove. The throttles, elevator and rudder trimmers, landing gear and flap selectors, fuel cocks and cooling shutter controls, are all mounted on a central pedestal. The engine throttle and constant speed propeller controls are linked in such a way that the operation of the throttle levers automatically adjusts the propeller constant speed unit, and hence the engine revolutions, to the most suitable speed for the boost selected.

"When taxiing, the forward view is completely unobstructed; the nosewheel is non-steerable but the brakes are powerful and smooth.

"There is little tendency to swing on takeoff and the safety speed of 78 knots is reached, in still air conditions, in 550 yds. In the air the Heron is stable laterally, directionally and longitudinally under all conditions of flight and throughout the permissible C.G. range. The controls are well harmonized and the handling characteristics entirely normal.

"Full de-icing equipment is fitted, and the provision of an auxiliary fuselage tank, increasing the total fuel capacity to 368 gal. enables stage lengths of 1,000 mi. to be achieved under IFR conditions with full allowances for diversion and holding. However, the additional 150 mi. range must be paid for by reducing the number of passengers by 2.

"The aircraft will cruise at a T.A.S. of 165 knots and has a service ceiling of 18,000', although the cabin is not pressurized, and no oxygen equipment is provided. At an all-up weight of 13,000 lb. the wing loading is only 26 lb. per sq. ft., and in conditions of severe turbulence a very rough ride can be expected.

"The comprehensive radio equipment includes 2 Radio Range-Receivers and 1 Radio Compass, 2 VHF Omni-Range (VOR) Receivers with ILS, and the equivalent of 2 50-channel VHF sets. This thoroughly adequate array has given excellent service, with the exception of the Radio Compass which has been virtually useless; and the provision of a more sophisticated compass than a P.12 would be appreciated.

"The Heron is fitted with dual control, but since all controls are readily accessible from the first pilot's seat the aircraft can be flown comfortably by one pilot under VFR. There is more than enough work for one pair of hands, however, under instrument conditions. On flights of more than 5 hrs. not the least of the pilot's worries is the realization that the lavatory is aft of the main cabin and that there is no relief tube in the cockpit.

"To exploit the all-weather capability of the Heron to the full, the first requirement is to have a number of pilots holding either USN or USAF instrument ratings for piston-engined aircraft (a jet card will not suffice) and more important, to keep these pilots in constant instrument practice. This is no easy task in a country where instrument procedures are complex, where not even the briefest flight can be planned by drawing a straight line between two points, and where the available pilots (with one exception) are all full time 'desk jockeys.'

"Both the USN and the USAF re-

(*Continued on page* 47)

# Greenhouse Patter

Let SKYWAYS readers share your flights and hangar-flying sessions. We invite your laughs and gripes in a breezy line or two; we'll go along on your wing.

*SAN FRANCISCO*—NBAA member Ed Gough (rhymes with cough) is President of Oakland Airmotive, President of Bay Aviation Services, Chief Pilot for Lawrence Warehouses, Inc., an All American tackle from Stanford and the worst gin rummy player west of Sapulpa. We caught him at his SFO airport office and learned of the tremendous (280x160) new hanger they are going to build at SFO for Business Aircraft. Ed's long experience as an Executive pilot is certainly reflected in the sharp line service which Bay Aviation Services offers the visiting firemen. A recent innovation is limousine service to downtown SFO or OAK.

*LOS ANGELES*—Some time ago we mentioned that On Mark Engineering had a pressurized turbo-prop 14-place Exec airplane on the drawing boards. Having received an initial order, they are going ahead with same in their new hangar at Van Nuys Airport. Mockup and wind tunnel tests in process. Plane is called, "The On Mark Marksman 450." Top cruise 436 MPH @ 30,000'. Ran into Bill Lear at Santa Monica who allowed as how this was the first time we have crossed elbows without his trying to peddle a Learstar or something else out of his store. George Haldeman was there too, with his little brother who is also an airplane driver.

*CHARLESTON, WEST VA.*—Here indeed is an example of what can be done by mountain people who really want an airport. You take two old hills side by each and knock off the tops letting the dirt therefrom fill in the valley between. Then, using a few hundred bulldozers, you rearrange the real estate to more suitable contours for the landing of flying machines. Taxiing around the perimeter is scary as hell when wet, but actually the Instrument Approach, ILS or otherwise, is safer than it appears, as the airport is the highest point around.

*MIAMI*—Haven't been here lately, but has anyone noticed Mert Madden's cable address? (Mert is President of Madden & Playford Aircraft, Inc.) It is MADPLAY! Appropriate, what? Have you seen the new terminal bldg. under construction there? Looks like Grand Central Station in king size. Understand they are going to have pressurized elevators.

*NEW YORK*—Idleberg and LaGarbage being befogged, we beat the morning murk into White Plains and once again marveled at the amazing people in New York Center. How they keep from going batty from the job pressure plus the little compensation they receive for a BIG JOB is incomprehensible. Incidently, some pilots and other aviation people have the mistaken impression that a Traffic Control Center is sacrosanct ground where nobody but nobody is permitted. It ain't necessarily so. Granted that when Instrument conditions prevail, it is no time for Sister Salubria and her Sanctimonious Serenaders to take the Guided Tour, but the boys are delighted to have YOU come up and they are justifiably a little proud of their operation. So effen you have never been in a CENTER, go man go. It's a real education and if nothing else is accomplished, it will certainly shorten up your radio procedures.

*TAMPA*—Here is a NOTAM gleaned from the teletyper at Tampa reprinted in its entirety:
"PIREPS OVER ERI LOST 50 KTS."
Probably lost 'em in a gin rummy game.

*SYRACUSE*—Chuck O'Connor, Jr., crown prince of the famous Flying O'Connors of Albany and points east, had us chuckling over stories of the family Stinson, an S Junior which Chuck, Sr. purchased brand spanking new. Claims it's the oldest plane with an OMNI in the USA. He sez, "The airframe is so magnetized it will suck a tool box clean across the hangar floor."
**Plan on attending the NBAA Meeting at DENVER—October 2-3-4.**

*(Signed)* **"Torch" Lewis**


SAC Silver Jubilee Newsreel

BY JACK PATTON

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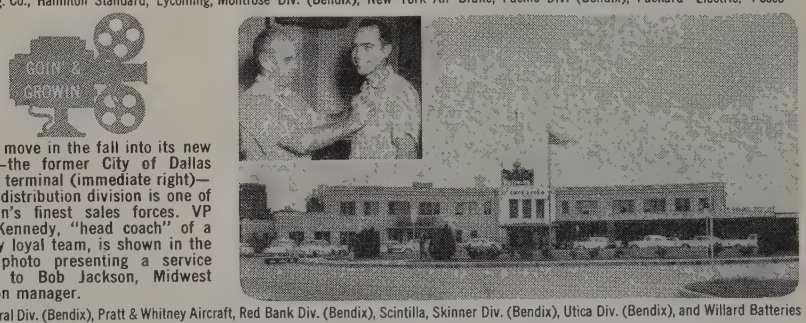
AC, Aeroquip Corp., A. P. Parts Co., Bendix Products Div., B. F. Goodrich, Canadian P & WA, Delco-Remy, Eclipse-Pioneer, Glidden Co., Gould Nat'l Batteries

Southwest Airmotive not only has pioneered many vital equipment-sales concepts, it also has done much to open the industry's eyes to a proud meaning and a new dignity in the word "distributor." The firm's role in worthy industry affairs is legendary, dating 'way back to such things as this SAC-sponsored WW II aeronautical tent-show.

Grimes Mfg. Co., Hamilton Standard, Lycoming, Montrose Div. (Bendix), New York Air Brake, Pacific Div. (Bendix), Packard Electric, Pesco




Set to move in the fall into its new home—the former City of Dallas airline terminal (immediate right)—SAC's distribution division is one of aviation's finest sales forces. VP Paul Kennedy, "head coach" of a fiercely loyal team, is shown in the inset photo presenting a service award to Bob Jackson, Midwest Division manager.

Pioneer Central Div. (Bendix), Pratt & Whitney Aircraft, Red Bank Div. (Bendix), Scintilla, Skinner Div. (Bendix), Utica Div. (Bendix), and Willard Batteries

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## Heads in the Clouds

(*Continued from page* 15)

maps, aerial photographs are widely used for mosaics. A mosaic is an assemblage of vertical aerial photographs matched together to form a continuous photographic representation of a portion of the earth's surface. Costly field surveying is made unnecessary by rapid, all-seeing aerial cameras, and by photogrammetric methods the mapmaker is able to make accurate representations of the earth's surface. Through the use of precision projection equipment, it is possible to compensate for variations in the line of flight of the aircraft. The result is a reliable and extremely valuable method of producing maps to serve every need.

Photogrammetry is a time-saver in measuring timber supplies, too. Kensall Wood, of Portland, Oregon, for example, uses aerial mapping equipment to tell Pacific Northwest lumbermen how much timber they can get out of specific tracts, without setting foot in the forests. His technique is to provide a contour map of the ground, then a similiar contour of the tops of the trees. The difference is the height of the trees, and hence a measurement of how much wood could be logged from them. At least half a dozen aerial mappers now qualify as "forest engineering specialists."

The Philadelphia Electric Company wanted an estimate of how much coal it had in huge piles at 10 different storage sites. Ground surveying crews would need weeks to measure and figure the contents of these coal piles. Aero Service Corporation, using a plane and a camera, took three-dimensional photographs of the coal mounds and translated them into contour maps of one-foot intervals. Each one-foot level of the coal pile was measured on the maps and its volume computed. Weeks of work shrank to days as the aerial surveyors came up with an accurate estimate of the mountains of coal in the stockpiles.

Dallas, Texas is one of the fastest growing cities in America. But with this growth has come the landslide of problems that accompany expansion. Water and sewerage facilities and other utilities rapidly became overtaxed. New street construction boomed.

The city tax department found itself faced with a formidable task in keeping abreast of new taxable property. Each department experienced a definite need for a complete set of accurate, up to date topographic maps of the entire city and also for a considerable surrounding area.

An area of about 340 square miles in and around the city was needed for the expansion program planning. City solons decided to conduct the mapping by photogrammetric methods due to the very considerable savings in money and time afforded by this method as compared to mapping by conventional ground survey methods.

Consider the problem facing city fathers of Snyder, Texas, where an oil strike doubled the town's population almost overnight. In a few days, the water supply was depleted, and sewers and waste disposal plants were overloaded. The village and its public service facilities were overloaded. The village and its services had to be redesigned in a hurry.

Jack Ammann, San Antonio photogrammetric engineering firm, was called in to map the town for contractors who would redesign water and sewage systems. The topographical data obtained by Ammann permitted preparation of an engineering contract in less than 30 days. It would have taken five months by conventional on-the-ground surveying methods.

There seems to be a notion, even among some surveyors and mappers, that photogrammetry is new-fangled, an infant prodigy that has not yet established itself as a full-fledged science.

The truth of the matter is that photogrammetry is over 100 years old! It was in 1852 that a French army officer, Aime Laussedat, produced the first maps ever made from photographs.

In May of 1862, just ten years later, a captive balloon bearing the Union Army insignia soared over Confederate forces deployed before Richmond. The Southern forces had no way of knowing, but what was happening was the first use of aerial photogrammetry in military history. The personnel in the balloon photographed the entire countryside; the photos were then analyzed by Union intelligence, and were used in subsequent balloon ascensions to gather much useful information on Confederate movements on the ground.

During the past hundred-odd years, photogrammetry has advanced from its first crude applications to a major engineering technique capable of producing measurements of the utmost precision.

Aerial surveying will not, of course, displace the traditional on-the-ground measuring done to define down to the last inch the limits of property, etc. But it is a great time-and-money-saver in large-scale surveying jobs.

And there are larger implications in the use of topographical maps derived through photogrammetry, too. One community gets a new industry . . . another isn't even considered. A right-of-way is chosen for a highway or railroad, and the engineers *know* they've chosen wisely, correctly, and quickly. "Lost land" is placed in the tax-books. Hitherto unrecognized natural resources become available.

Listed below are a few of the uses of photogrammetry:

| | |
|---|---|
| Zoning | Traffic Studies |
| Tax Maps | Strip Mining |
| Mosaics | Military Maps |
| Levees | Irrigation |
| Geology | Flood Control |
| Drainage | Soil Conservation |
| Stock Pile Inventories | |
| Sewer and Water Systems | |


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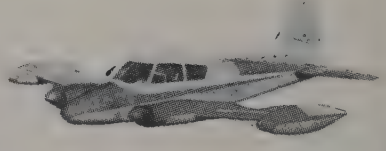

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Airport Planning and Design
Aeronautical Charts

## New Series of Nylon Seat Belts

A new series of nylon web aircraft seat belts, available in seven colors to match interior appointments of most business planes, is in producion by Russell Mfg. Co., pioneers in the field. The buckle is composed of heat treated chrome moly steel base, and has an aluminum lever. Belts are available with adjustable or non-adjustable end fittings.

Cotton-webbing belts are also available from the manufacturer. All belts have been approved by CAA under Technical Standard Order C22b.

## Brushless Generator Described For Use in Future Aircraft

An easily-maintained, "environment-free," air-cooled brushless generator was described at a recent meeting of the East Central and Middle Eastern District of the American Institute of Electrical Engineers.

The brushless generator seems particularly suited to the quantity and complexity of electrical apparatus on aircraft, said R. E. Smith, of Westinghouse.

Among its advantages, he listed: greater altitude capabilities due to no brush-wear problems; greater reliability because of elimination of brushes, commutators, slip rings; simplified maintenance due to fewer parts.

**WATCH FOR**

**September Pre Convention Issue.**

**Reporting on manufacturers serving the business aircraft industry**


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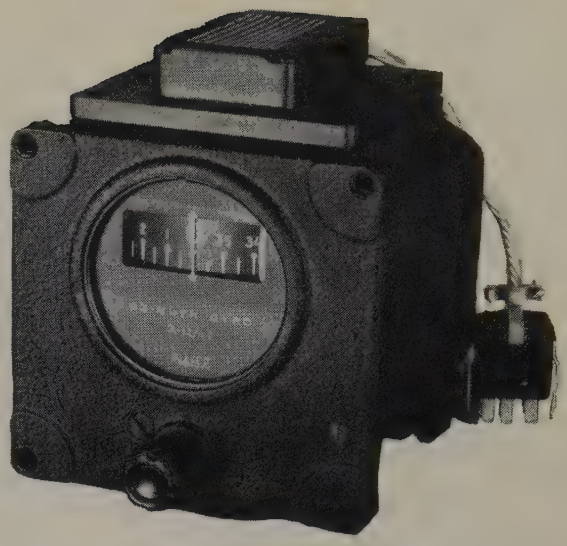
NOT

TWO

G-12 and L-2



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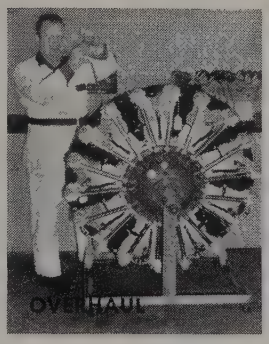

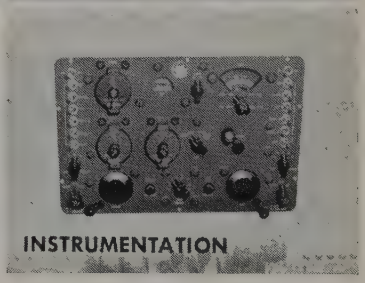


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# . . . . in the business hangar

(*Continued from page* 32)

a Lear L-2 Autopilot and Model 2200 Marker Beacon in Fretwell Motor Co.'s E-50 Twin Bonanza. Also installing Lear ADF-12E, Omnimeter System and spare RT-10 in Air Sales' H-35. ☐ General Aviation, Inc., Willoughby, O., is installing a Lear L-2 Autopilot with automatic approach coupler in Wilson Marine Transit Co.'s Cessna 310 (Roland Kollar, pilot). ☐ Air-Oasis Co., Fresno, has completed Lear ADF-12E and LTRA-6T installations in Cessna 182's of Earl Wilson and Walter Robertson, and their own 182 demonstrator. Also a Lear LTRA-6DM in their 172 demonstrator, and an ADF-12E in L. B. Hill's Cessna 310. ☐ Cruse Aviation, Inc., Houston, has put a Lear ADF-12E and LTTR-6 in John B. Church's Cessna 172; ADF-12E in the Robt. H. Ray Co.'s 182, and LTRA-6 Combination DM in Murphy Engineering Laboratories' Cessna 172. ☐ Tradewind Airport Corp., Amarillo, has installed Lear LVTR-36 in Dr. Bill Stevenson's Beech H-35 and LTR-800 and Vortran in J. A. Whittenburg's Cessna 310. ☐ Baker Aircraft Sales, San Jose, recently equipped Fudenna Bros.' Apache with Lear L-2 deluxe approach coupler, Altitude Control and ADF-12E automatic direction finder.

■ **Newark Air Service,** Newark Airport, N.J., is offering a folder showing its new facilities and services for business pilots and executives. The folder also features a map of Newark Airport. Request folder from: D. L. Steege, Mgr., Newark Air Service, Inc., Hangar 12, Newark Airport, Newark, N.J.

■ **Dallas Aero Service** recently had Irving Air Chute Co.'s DeHavilland Dove in for double engine-change, prop overhaul and X-ray inspection. ☐ Ernest Webb flew Textile, Inc's Dove to DAS for repairs and relicensing. ☐ D. Harold Byrd's Lodestar has been in for radio wiring, flown by George Mays. ☐ D. D. Feldman's Learstar (John Rich, pilot) had a double engine-change. ☐ Kirsch Co.'s DeHavilland Dove was brought to DAS for a double engine-change and generator modification.

■ **AiResearch Aviation Service,** div. of Garrett Corp., received Gen'l. Petroleum's DC-3 for extensive work, including: exterior paint job; control-surface recovering; new instrument panel; Sierracin one-piece windshield; engine change from 1830-92's to 1830-94's; miscellaneous radio work, and an AiResearch rudder modification. ☐ Angelo Pappas flew Axelson Mfg.'s DC-3 in to AiResearch for 100-hr. inspection and aileron-rudder recovering. ☐ AiResearch is installing a gas turbine GTP70-10 in a CAA Convair 440. It'll be the first such installation in a 440. Also installing RCA AVQ-10 radar, with two indicators, one in pilot compartment and the other aft in the cabin. ☐ All engineering for installation of GTP70-10 gas turbine in a Navy R4Y (Convair 440) has been completed by AiResearch. The Navy will do the actual installation. ☐ Eight berthable-type divans have been designed and are being fabricated by AiResearch for two Convair 440's of Union Oil Co., and one owned by Gulf Co.

■ **Pacific Airmotive,** Burbank, recently returned Union Oil's CV-340 to chief pilot Jim Stevenson after speed and sound conversion; single engine change; modification of cabin floor and interior furnishings; installation of propeller-reverse lights; accessory overhaul; partial paint; new brake lines, and compliance with a number of service bulletins. ☐ Westinghouse Electric's chief pilot "Curly" Korb is flying the co.'s Lodestar again after PAC-Burbank did the following: 100-hr. inspection; relicense; installation of radome; A-12 autopilot; engine analyzer; new instrument panel and paint job. ☐ Forest Oil's Lodestar has been delivered after PAC installed proprietary short stacks; Janitrol heaters in nacelles; PacAero's rudder-boost kit; PAC-Aircraft Tank Service's wet-wing modification; annual relicense and paint job. ☐ Sunray Mid-Continent Oil's Lodestar is back in Tulsa after installation of nose pitot masts; removal of dump-chutes; new instrument panel; dual vacuum system; wiring and weight-and-balance. ☐ Northwest Pipeline's Lodestar has had a PAC engine change, propeller overhaul, gear check and other maintenance. ☐ Westinghouse Air Brake's Lodestar, flown by Capt. Frank Mills, is back in service after a single engine change; installation of Barber-Colman automatic temperature regulating controls; PAC's proprietary flush dump chute; X-ray of wings, landing gear and other components; partial paint, and other work items. ☐ PAC performed spar X-ray on DeHavilland Doves owned by Interstate Motor Lines; Shell Oil; R. M. Barrett and Barron Hilton. ☐ Axelson Mfg.'s DC-3 was in for an engine change. ☐ J. C. Cooney, Sangamo Electric's pilot, brought the co.'s Lodestar in for minor maintenance. ☐ A twin-Beech operated by Producer's Cotton Oil was in for engine change and other maintenance, flown by "Bud" Miller. ☐ PAC has completed 100-hr. inspection and pick-up of discrepancies on Monterey Oil's PBY flying boat, piloted by Bill Arnott and Jim Keegan.

■ **San Jose Avionics Co.** has completed installation of complete navigation and communication radio system in John Delphia Co.'s twin-Beech, including: ARC-15D Omni; T-11 Transmitter; F-13 Speaker-Amplifier; Dare 22-channel transmitter and Flite-Tronics MB-3 Marker. ☐ John Kendall, chief pilot for Food Machinery & Chemical Corp., took delivery of co.'s twin-Beech after installation of Dare DTR-360 and complete new radio wiring system. ☐ Lloyd Hayes brought his new Cessna 172 in for installation of complete Dare navigation and communication system. ☐ Shell Oil pilot Ray Wilson brought in the co.'s twin-Bonanza for installation of ARC Type 21 ADF. ☐ Air Associates had Narco 1016 Sapphire installed in their Cessna 172 by San Jose Avionics. ☐ Sun Garden Packing Co.'s 680 Aero Commander was delivered after installation of ARC 15D Omni, Marker Beacon, Speaker-amplifier, Type 21 ADF and Dare DTR-360.

■ **Qualitron, Inc.,** of Burbank, is installing Bendix radar in a Bethlehem Steel Co. Lodestar (Al Junker, chief pilot). ☐ Gulf Oil's Convair 440 is undergoing Qualitron radio modification, including ad-

dition of Collins IFS, Sperry engine analyzer and Collins 618S H.F. system. ☐ Complete navigation and communications system is being installed for Dan Peterkin, Jr., in his PV-1 (Walter T. Brownell, chief pilot). ☐ Elmer Spencer flew the Murray Corp. of America's Convair 240 to Qualitron for complete radio installation. ☐ A second Westinghouse Electric Lodestar was flown to Qualitron by Bob Nagle for installation of Bendix radar and Sperry engine analyzer.

■ **Airmar Radio Service, Inc.,** at MacArthur Airport, Ronkonkoma, N.Y., has installed dual ARC Type 21 ADF in Westinghouse Air Brake Co.'s Lodestar (Frank A. Mills, chief pilot). ☐ Airmar installed a complete new radio system in Pittsburgh Plate Glass Co.'s DC-3 (C. E. Newton, pilot), including: Bendix RDR-1C Radar System; Bendix TA-20A & RA-18C-2 VHF; Bendix MN-5313 Marker Receiver; Collins FD-104 Integrated Flight System; Dual Collins 51R-3 VHF Navigation; additional radio equipment; custom control panels; public address system and cabin radio. ☐ The Sarah Mellon Scaife DC-3 (J. E. Leonard, pilot) has had installation of dual ARC Type 21 ADF; Bendix TA-20A & RA18C-2 VHF communications, and new custom radio control panel. ☐ Don Douglas flew Home Oil Co.'s Lodestar in for Bendix TA-20A & RA18C-2 VHF communications system. ☐ Grumman Aircraft's Mallard (Henry Schiebel and Jack Schnabel, pilots) has had installation of complete new radio system, including: Dual ARC, Type 21 ADF; Collins 51R-3 VHF Nav. system; ARC Type 15 Nav. system; Sperry C-2 Gyrosyn Compass; Collins 17L-3 & 51R-3 VHF, and ARC-1 VHF commun.

■ Lee Snow brought the Offshore Company DC-3 to **Remmert-Werner** in St. Louis for installation of the new lightweight landing gear doors, one-shot Bromide fire extinguisher sytsem, Edison fire detector system, and geared rudder tab modification. ☐ The Falstaff Brewing Corporation DC-3 was in St. Louis for a double engine change and an Aerojet rocket engine installation by Remmert-Werner Inc. Hank Haddock is chief pilot. ☐ Milner Enterprises had a double engine change on their Lodestar. Chuck Morrow is pilot. ☐ National Breweries DC-3 was at Remmert-Werner in Pompano Beach, Florida for an 8000 hour overhaul with center section modification, installation of a Bendix X-Band radar, with Remmert-Werner hinged radome and swingaway antenna mount, engine change, modification of heating system, new exterior paint, and complete new interior. John Trotter is chief pilot.

■ CAIR, Chamberlain Aviation, Akron, has installed airborne weather radar and Cair radome on the Learstar operated by Lubrizal Corp. John Hosier is pilot. ☐ Gerstenslager Co. has taken delivery of their new D18 *Pagan*, a completely modernized airplane to be flown by Marshall McDowell, Chief Pilot. ☐ Airborne Sperry Engine Analyzer installed in Learstar owned by Square "D" Co. Dick Dickerson is Chief Pilot. ☐ Fred Gill, Chief Pilot for Aircraft Sls. Co., Pittsburgh, had their Aero Commander 680 in the Cair hangars recently for complete radio installation and exterior painting. ☐ Bendix Av. Corp.'s DC-3 flown in by Chief Pilot Andy White, was in for an engine change. ☐ Radar service completed on DC-3 aircraft owned by Sears, Roebuck Co., Vic Swanon, Pilot; Ideal Cement Co., Forest Conover, Pilot; U. S. Rubber Co., Paul McCahill, Pilot. ☐ Cair wing tank fuel systems purchased by Collins Radio Co., Reynolds Metals, and Aerial Surveys for installation in D18 aircraft.

■ **Horton & Horton Custom Works, Inc.,** Fort Worth, Tex., chalked up a "first" by using U.S. Rubber's "Flair" headlining, and "Soji" Butterfly Slidescreens instead of fabric draperies. This was done on a Lodestar N300E brought in by Fred Ayer of Linden, N.J. The Lodestar was subsequently displayed at the Reading Air Show. ☐ Pfeiffer Brewing Co.'s Detroit-based Lodestar has a new "cleanable" interior by H & H. Lightweight plastic simulated-wood panelling was used on the forward bulkhead, and driftwood-oak Formica for the cantilever-style card tables. ☐ A chestnut off-white color scheme, using handprinted linen draperies, was chosen by Bill White, vp of Brown Aero Corp., Dallas, for the firm's new H & H 520 Aero Commander Interior. ☐ Recent H & H interiors in Bell "J" helicopters were for: Arthur V. Davis, Florida; Whitley Collins, President, Northrup Aircraft; the President of Colombia, S.A.; 2 for President Eisenhower; NBAA member Burlington Industries, Greenville, N.C., and the New York Police Dept.

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## Round Table

(*Continued from page* 14)

everything right behind him. The starting procedure would be done as two people."

**Banfe:** *"VFR clearances certainly present a problem with several men in the cockpit. Doug Garneau, what do you think of IFR clearances for executive aircraft?"*

**Garneau:** "With air traffic as heavy as it is, and communications as overcrowded as they are, all pilots should try to file, by phone or in person, all flight plans with the CAA, before taking off, if possible."

**Banfe:** *"Elton Stone, what is your opinion on the matter of fatigue induced by flying too many hours? Has your experience been that executive pilots are sometimes subjected to too many hours?"*

**Stone:** "Yes. As you know, executive aircraft have no maximum flight limitations on time-on-duty or time in the air. There have been cases in which executive aircraft have flown a total of about 27 hours straight flying, with over 35 hours on duty. We all know that the proficiency of the pilot goes down rather rapidly after the first 6 hours."

**Banfe:** "An accident at Idlewild a few years ago was entirely the result of pilot fatigue. The pilot was assigned 22½ hours of flying, arrived over Idlewild with another 2½ hours of hold, and lost the aircraft when he tried to make an ILS approach. *Chuck Holcomb, what do you think about the importance of getting enough rest before a flight?"*

**Holcomb:** "It's a very important item. My company's viewpoint is that we should try to get at least 8 hours' sleep, and where flights are scheduled that is accomplished most of the time. It may not be possible if we have a flight late the previous day and another one early the next day, but I know from personal experience that lack of sleep is very dulling to your ability to concentrate. Instrument flight becomes much more difficult."

**Banfe:** *"Frank Emenegger, we know that we get lots of reports on near-misses; don't you think it would be valuable to the business pilot to have some near-accident reports?"*

**Emenegger:** "That would be very beneficial. We had one just the other day. We were on an ILS approach into Portland Airport and some pilot was trying to approach VFR below the overcast with no radio contact whatsoever. Fortunately, radar picked him up at the middle marker just seconds before we checked the same position. We made an immediate pull-up, and, thanks to radar, avoided a near-accident, or possibly a collision. I believe publicity of these near-accidents would benefit all pilots."

**Banfe:** *"We hear a lot about accidents, but how often do we hear about the small but significant things caused by complacency in the cockpit which almost cause accidents? Kent Davis, don't you think there are probably many such instances that we don't hear about? For example, the man who doesn't bring his flashlight on a night flight, and perhaps gets lost and the lights go out in the cockpit, and who has nothing but a match to check what is on the chart."*

**Davis:** "No doubt there are thousands of such occurrences; I would like to see more of them published. They are supposedly written up and sent in to CAA in Washington. It would help if they would put out a tabulation of incident reports which otherwise we in the field or the industry as a whole would never hear about."

*"COMPANIES CAN HELP their pilots to avoid errors made through complacency by advising them of all pertinent information," says Doug Garneau, of Utach Construction.*

**Leckie:** "The military, and especially the Navy, has a really excellent system of reporting these near-accidents. I believe that no accident is ever the result of just one single incident, but rather that it is the cumulative effect of several things which go wrong, which mount up and get beyond the pilot's ability to handle them. I also feel that many of the accident investigations and analyses are often the result of sheer guesswork, although meticulous care is taken in trying to reconstruct the accident.

"The Navy has a very helpful program under which pilots are permitted to submit anonymous reports describing incidents which almost led to an accident. These reports appear in the Monthly Aviation News, and are very valuable because they present you with a set of circumstances—first one thing going wrong, then another—which cumulatively nearly led to an accident. It's not looking at it after the accident occurred.

"An anonymous system of reporting these incidents would be very valuable to executive pilots, because they're faced with pretty much the same problems, depending on the areas in which they fly. An honest recitation without identification of the pilot wouldn't hurt anyone. I think it might be a very valuable addition to SKYWAYS."

**Banfe:** *"It certainly sounds very good. Elton Stone, as a Lodestar pilot, what do you think of the idea of changing procedure after about 500 or 1000 hours because by that time you know the aircraft better?"*

**Stone:** "No, I don't agree with that. I think everyone should stick pretty close to the standard flight procedures that are acceptable today. A standardization program has been set up for every aircraft that ever came out. If a pilot decides to establish his own cockpit procedures and flight procedures, he's deviating into things he hasn't been trained in.

"Of course, operation of business aircraft differs from standard airline procedure, but on the question of how to fly a particular aircraft, I think you should standardize according to the manufacturer's specifications."

**Banfe:** *"What about going back to school periodically for a couple of weeks' training in your own type aircraft?"*

**Garneau:** "That would be very valuable, but if the school is too far away or the company can't afford it, there is the local CAA. Both Kent Davis and Jim Leckie will give you the necessary training."

**Banfe:** *"Hal Keefe, how does our thinking here differ from what you have been familiar with in Canada?"*

**Keefe:** "It doesn't differ at all in the problems we have been talking about. I do feel, however, that the checklist can breed complacency in the cockpit unless it is used as an aid to doing a good job. No one can argue that it isn't important, but the pilot must remain flexible. The same trend of thought would also pertain to flight planning, receiving clearances en route, and so forth.

"In Canada, it is mandatory with every Class I rating to receive a proficiency check from a Dept. of Transport flight inspector. This check is very complete, and is made either at the pilot's home base or some other location within the district. We have had very good results with that system in Canada, and I would certainly like to recommend it to the CAA here. I realize that it would be a tremendous job to do it down here, with the tremendous number of instrument pilots you have. On the other hand Canada is a very sparsely populated country. We are able to do it there; I think it could be done here."

**Banfe:** "Recently the Air Force stated that any man who has used a tranquilizer must be grounded for a certain length of time. This brings us to an-

*CHUCK BANFE POINTS OUT that "the more familiar we become with our aircraft, the more complacent we tend to become." His words are noted by Frank Emenegger and Charles Holcomb, Aero Commander pilots.*

other aspect of complacency in the cockpit: the built-in complacency of a man who is so emotionally upset that he doesn't give enough attention to the requisites of a safe flight, or who is ill or has taken some medicine which prevents him from giving full, clear attention to flying his airplane."

**Emenegger:** "Definitely, a man should not fly in those circumstances. In our company we have a policy that if we have a cold, or have taken any medicine which might impair our abilities, we will ground ourselves. We aren't criticized; in fact, we are commended for doing it. I think it's a very good attitude on the part of the company. It's not right for a company to insist that when they want to make a flight the pilot should be there regardless of how he feels."

**Leckie:** "It has been definitely proved that certain of these 'wonder-drugs' lower the pilot's physical efficiency.

"On the subject of fatigue, the military services have run some intensive studies to find the relationship between fatigue and accidents. On a gunnery flight, for example, where they can definitely trace overall performance of the pilot during a 2-hr. period, it has been learned that pilot proficiency is at its lowest point during approach and landing, which is actually when the pilot should be his sharpest, because that is where we get our greatest number of accidents. Even if a pilot feels just as proficient as ever, it has been proven that he is not."

**Garneau:** "Sitting in an airport can be just as fatiguing as flying. If you plan your flight before starting, and you know that you're going to have 6 hours' wait between 2 short flights, there are better places to spend it than sitting at an airport terminal, where you often can't even find a place to sit down. It all goes back to flight planning."

**Banfe:** *"Doug Garneau, I want to ask you about 'Hurry-home-itus.' What do you think of the pilot whose minimums are 500 feet who perhaps goes down to 400 feet because he has 5000 hours on that aircraft?"*

**Garneau:** "He's digging his own grave. The pilot who goes below minimums because he is in a hurry to get home is sticking his neck out a mile."

**Banfe:** "Gentlemen, thank you for your contributions to SKYWAYS' Round Table on Complacency in the Cockpit.

"I think I may summarize our discussion by saying that we all know that flying is a serious, responsible occupation requiring a high level of proficiency, and that the only way we can maintain that proficiency, and keep complacency out of the cockpit, is through self-discipline and practice, quizzing each other, availing ourselves of instrument checks by CAA inspectors or chief pilots, by practicing emergency procedures, instrument flying and instrument approaches.

"It was pointed out that no pilot should ever fly if he is emotionally upset, unwell, or under any tension whatever, that a pilot should have adequate rest and be up to proficiency for his flight, and that he should never let 'Hurry-home-itus' interfere with his judgment.

"A pilot should never assume that he is immune to mistakes because he has plenty of flight time. We have heard examples of what can happen when a pilot assumes that his airplane is in perfect condition, when he assumes that he can make a safe flight without planning it, when he assumes that fatigue doesn't affect him as much as it does other pilots.

**"Safety is simply a state of mind, and pilots can transmit it among themselves. It can be contagious: one pilot talking to another about the necessity of the checklist, strict adherence to minimums, practice of emergency procedures. If safety can be a disease, let's start an epidemic in the cockpit."**

## Safety Exchange

(*Continued from page* 24)

shock. His subsequent transmissions were delivered in a belligerent, uncompromising manner, the antithesis of the behavior to be expected of a pilot who is facing a potential emergency which is jeopardizing the safety of his aircraft and who desires or needs assistance. *(See Examiner's note.)*

"The examiner has found that Captain Specht's failure to maintain his clearance altitude was not justified by an emergency situation which required immediate action, and therefore violations of Section 60.19 *(ATC Instructions)* and 60.21 *(Adherence to ATC Clearance)* of the regulations are established. These violations, *ipso facto*, do not also constitute a violation of Section 60.12 *(Careless or Reckless Operation)* but may be a violation of that section depending upon the conditions existing at the time *(Ed. note: The pilot disregarded an offer of a VFR-restricted climb to the altitude he wished)* and the manner in which the actions which resulted in these violations were conducted.

*(Examiner's note: The examiner does not either condone or condemn the actions of the controllers . . . since this issue is immaterial . . . the situation might have been obviated by the use of a little tact and patience . . . . . They suggested no alternatives, such as, a different routing, the possibility of obtaining 16,000 or 18,000 by delay, or . . . . subsequent to passing Wilkes-Barre.)*

"IT IS ORDERED, That the Airline Transport-pilot Rating held by Leonard J. Specht be, and the same hereby is, suspended, effective the 28th day of May, 1957. This suspension shall continue in effect for a period of four months."

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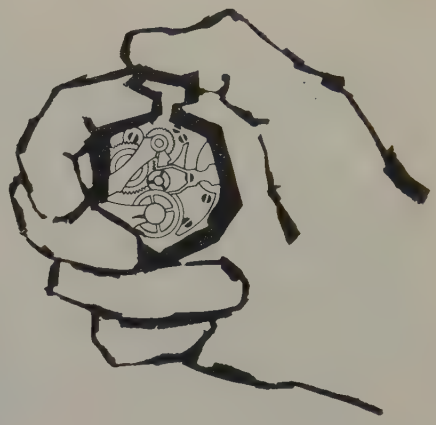
**Circle your calendars in home, office, and cockpit now for the NBAA annual convention on Oct. 2, 3, 4, Denver, Col.**


With A



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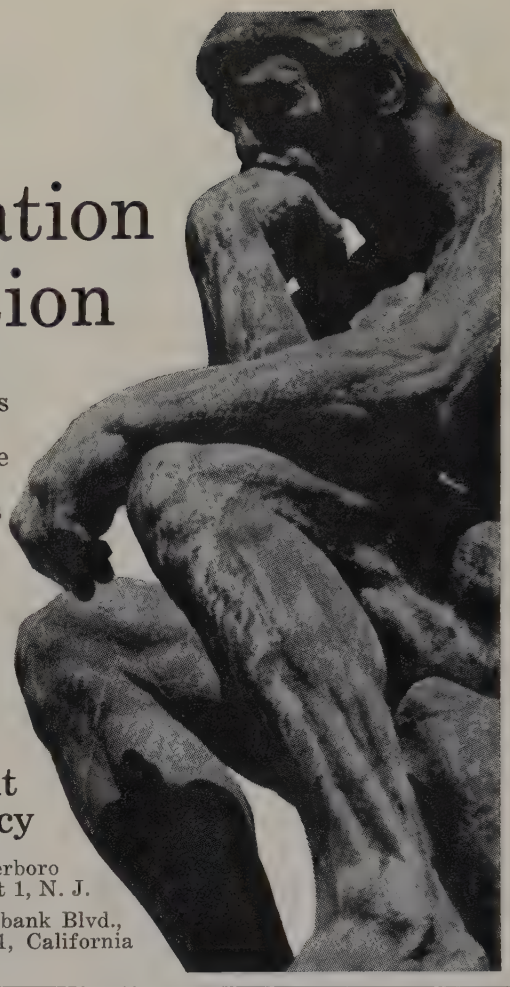

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## NAVICOM

(*Continued from page* 19)

### Plans Announced For Coded Transcontinental Airways

A plan for 12 east-west trans-continental airways designed for flights between New York and Washington and San Francisco and Los Angeles, was announced by James T. Pyle, CAA Administrator.

The direct transcontinental airways will greatly reduce the number of direct routes now used, will simplify flight planning for both pilots and air traffic controllers and bring about a great reduction in the amount of data that will have to be passed between CAA air route traffic control centers.

The newly announced airways coincide with many already established airways. The segments of the routes not now commissioned as airways will be implemented with air navigation aids over the next 18 months.

Two of the newly designated routes are fully implemented. Victor 1510, between New York and Los Angeles via Chicago, Omaha, Denver and Las Vegas, and Victor 1518, between Washington and Los Angeles via Nashville, Tulsa, Oklahoma City and Albuquerque, are completely equipped with the necessary aids for immediate use.

The new airways will be known as "Victor 1500 series" and are based on VOR facilities. They have been assigned numbers 1500-1502-1504, etc. through 1522. When established, north-south transcontinental airways will be numbered 1501-1503, etc.

A pilot in either New York or Washington wishing to file a flight plan for Los Angeles or San Francisco can merely request clearance over the proper Victor 1500 series, and his route will immediately be known to CAA control facilities.

Since the 12 new airways touch most of the large cities between the east and west coasts, a pilot having stops along the routes merely plans his flight along the route that takes him to his intermediate stop or stops.

The ten airways requiring additional navigation aids for full use run along a line formed in part by navigation aids at the following locations:

Victor 1500 between San Francisco and New York via Reno, Nev.; Pocatello, Idaho; Sheridan, Wyoming; Minneapolis, Minn.; White Cloud, Michigan; Erie and Allentown, Pa.

Victor 1502, between San Francisco and New York via Reno, Nevada; Pocatello, Idaho; Rapid City, South Dakota; Milwaukee, Wisconsin; Cleveland, Ohio; Pittsburgh, Pa., and Martinsburg, West Virginia.

Victor 1504 between San Francisco and Washington via Reno, and Elko, Nevada; Casper, Wyoming; Sioux Falls, South Dakota; Milwaukee, Wisconsin; Cleveland, Ohio; Pittsburgh, Pa., and Martinsburg, West Virginia.

Victor 1506 between San Francisco and Washington via Salt Lake City, Utah; Sioux City, Iowa; Rockford, Ill.; Waterville, Ohio; Morgantown, West Va.; and Front Royal, Va.

Victor 1508 between Los Angeles and New York via Daggett, California; Las Vegas, Nevada; Waterloo, Iowa; Rockford, Illinois; Carleton, Michigan; Jefferson, Ohio; Phillipsburg, Pa.

Victor 1512 between Los Angeles and New York via Daggett, California; Farmington, New Mexico; Pueblo, Colo.; Topeka, Kansas; Kansas City, Mo.; Springfield, Illinois; Dayton, Ohio; Pittsburgh, Pa; and Red Bank, New Jersey.

Victor 1514 between San Francisco and New York via, Basalt, Nevada; Pueblo, Colorado; Kansas City, Mo.; Dayton, Ohio; Pittsburgh, Pa.; and Colts Neck, N. J.

Victor 1516 between San Francisco and Washington via Las Vegas, Nevada; Anthony, Kansas; Farmington, Missouri; Evansville, Indiana; Louisville, Ky.; Elkins, West Va.; and Front Royal, Va.

Victor 1520 between Los Angeles and Washington via Needles, California; Springerville, Arizona; Little Rock, Arkansas; Memphis and Knoxville, Tenn.; and Front Royal, Virginia.

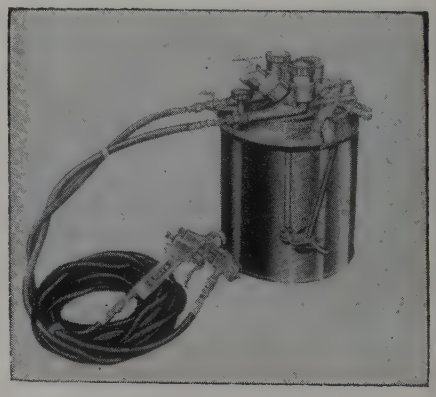
Victor 1522 between Los Angeles and Washington via Tucson, Arizona; El Paso and Dallas, Texas; Texarkana, Arkansas; Birmingham, Alabama; Atlanta, Ga.; Greensboro, North Carolina; and Gordonsville, Virginia.

### New Paint-Spraying Method

The new Graco "Redi-Spray," by Gray Co., Inc., is a self-contained unit with no gears or moving seals. It operates on the same principle as an automobile fuel pump.

Designed specifically for use where numerous short-run colors are needed, the unit mixes and pumps all multi-color paints, standard paints, primers, vinyls, sealers, etc., direct from original 1-5 gal. shipping pails, without pressurizing the container.

The unit reportedly requires no bleeding, and color changes can be effected in seconds.



## Policy for Air Space

(*Continued from page 29*)

taken by the applicant.

Aside from tall tower problems there are other recent developments which have required additional panel study, one being Air Space Panel policy with respect to the release of free balloons.

Present policy applies only to Department of Defense projects. The Department of Defense program was approved in 1954, as being an "acceptable hazard" after it was found to be in the national interest. Various safeguards were then stipulated to lessen the extent of the hazard, such as selected release points, limited flight duration, tracking and plotting facilities, forecast of probable drop zones and communication procedures.

Now, however, the Panel has requests for balloon releases by private research firms. In addition, balloon releases on a world-wide basis are planned for the coming International Geophysical Year.

Panel policy with respect to navigational aids for the airways system is another area which demands consideration. Will TACAN be considered only as a terminal aid or will it be designated as an enroute facility as well? How soon will VORTAC be able to tie in with TACAN? What about enroute and terminal procedures in those locations where the aids are not co-sited?

The designation of airways to complete the high-altitude route structure is another area of present concern. Although 90% of the routes will be over existing airways, designation of the remaining 10% poses many difficulties because of air-space conflicts.

During the past year the Panel coordinated the conduct of an extensive survey of all restricted and controlled air-space in the United States, with a view to achieving more efficient air-space utilization and to obtain an idea of the problems to be expected in the future.

As an aid to a proper perspective of the problem: in 1948 there were 56,000 miles of airways and 200 Restricted areas; today, there are 167,000 miles of airways and 300 Restricted areas.

The above figures leave little doubt that our air-space is a rapidly dwindling resource that must be carefully guarded to assure the growth and comparatively unhindered operation of aviation.

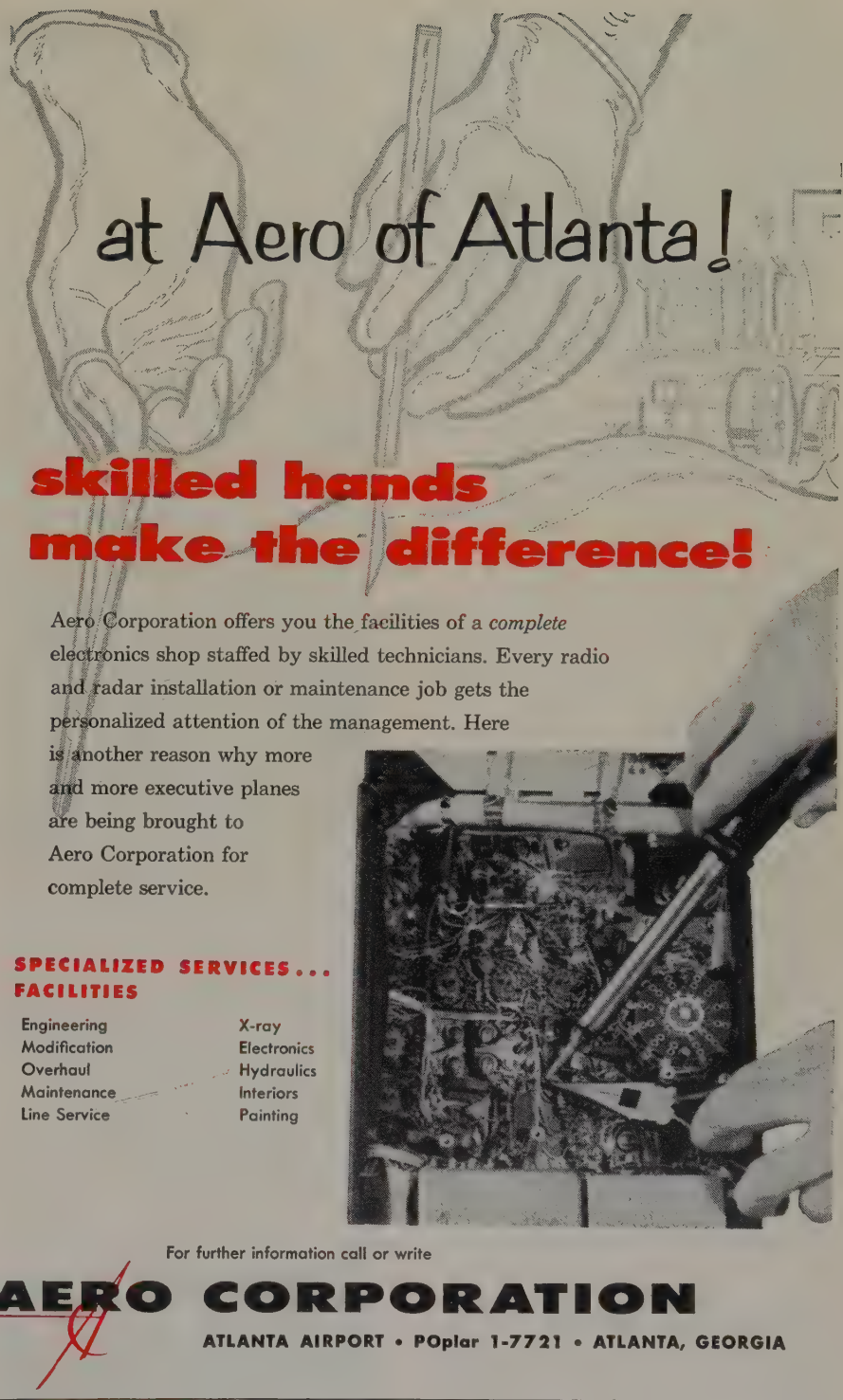
From time to time NBAA Headquarters in Washington brings particularly involved cases to the attention of the members located in the area or areas to be affected. On occasion, NBAA members are requested to appear before the Air Space Subcommittees to present business aviation's views on the case under study.

All cases submitted to the Air Space Panel in Washington are reviewed in advance of hearing by NBAA staff and appropriate counsel is given the Panel at their regular meetings.

New legislation, in the making as the result of the Curtis report on air space use problems, may force a drastic inventory of the use of our air-space and could result in a more effective airways system.

We may, some day, even have airways with no "dog legs" to bypass a military reservation which is conducting infantry maneuvers.

**REMEMBER: NBAA's Tenth Annual Forum, Oct. 2, 3, 4 in Denver, Col.**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## Whirly-Bird Makes Good Tugboat

According to "Planes," official publication of Aircraft Industries Assoc., the helicopter makes an excellent tugboat.

This conclusion is arrived at as a result of tests in which a military helicopter towed a 3000-ton LST at half the LST's normal cruise.

Test revealed the LST to be more maneuverable under aerial tow than under its own power. It also showed that cable-snapping was practically eliminated by helicopter-towing.

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## Flashlight Clipboard

A clipboard with built-in illumination should make a very helpful cockpit companion for flight charts, checklists, or for legible notes made by service and maintenance mechanics in poorly lighted areas.

"Ray-Rite" is reported to have found ready acceptance in stockrooms, warehouses, service stations, hospitals, etc. It is made in 3 standard board sizes to fit standard business forms or paper sizes. Boards of Masonite or aluminum may also be ordered in special sizes, or the flashlight and clip section may be ordered separately and fitted to any special size board required.

Standard Ray-Rite boards are powered by 2 standard flashlight batteries. A special 3-cell unit is available on special order to accommodate flight charts or other large writing surfaces.

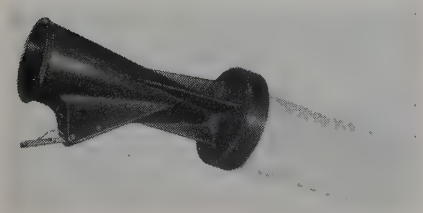
Ray-Rite is manufactured by Mutual Engrg. & Mfg. Co.

## New Pilot Relief Container

A new pilot relief container has been designed by Electronic Communications, Inc., for distribution through the Air Associates supply div.

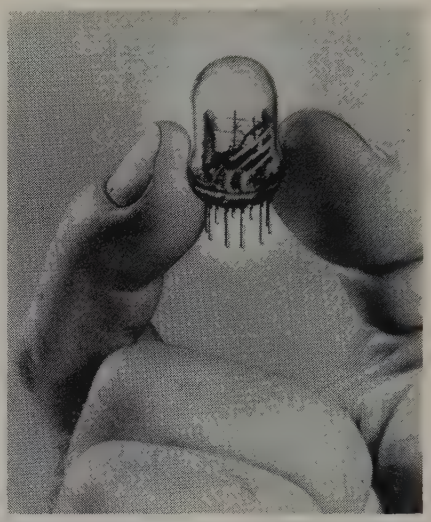
The new product consists of a polyethylene horn and detachable container with a spring action valve.

The container requires no installation, eliminating the need for venturi and accessory parts; special brackets are available for mounting.



## Miniature "Read-Out" Tube Developed by Burroughs

A miniature, all-electronic device which converts electronic signals directly to readable characters—the miniature "Nixie"—has been announced



by Electronic Tube Div., Burroughs Corp., Plainfield, N. J.

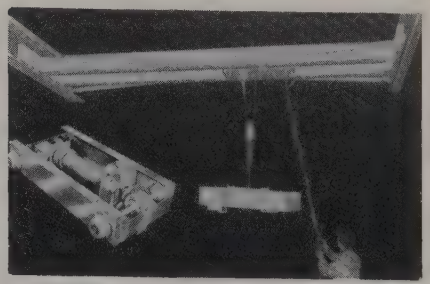
The tube is 6/10-inch in diameter, ¾-inch high and clearly visible at ten feet. It uses 100 volts and only ⅛ watt.

The tube is designed for miniaturized instrumentation where read-out is required, such as aircraft instruments.

## Low Head-Room Crane Offered

Atlas Industr. Corp. announced the introduction of a new Atlas Low Head-Room Crane.

It is a two-ton unit which fits into a height of within 12-inches. The hoist

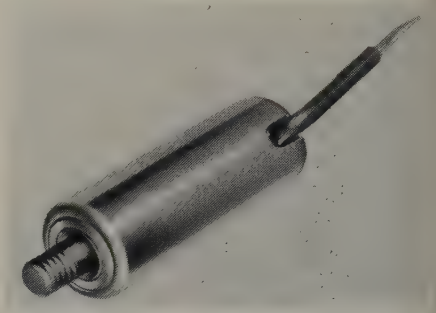


is electrical, with hand-or-electrical lateral mobility. The overhead crane can be finished as a dolly or a complete crane. The unit lifts up to 50 feet.

## Miniature Pull-Type Solenoid

Reported to provide high efficiency with very low plunger friction loss, a miniature pull-type solenoid for aircraft and electronic applications is announced by Carruthers & Fernandez, Inc. The new unit has an operating temperature range from—65°F to 100° F; it was designed to meet MIL-S-4040 specs.

Operating voltage of the solenoid is from 6-100 VDC, with plunger operating under side force of 8-10g. At 3 amps, 100 VDC, 78°F, force is 1.3 lb. with stroke of .03". At these same conditions, force is .8 lb. with stroke of .06", and .4 lb. with stroke of .125".



## New Line of Aircraft Tires

A new line of airplane tires, reported to incorporate features developed and tested on military jet aircraft, is being made available to owners of light business aircraft by Firestone Tire & Rubber Co.

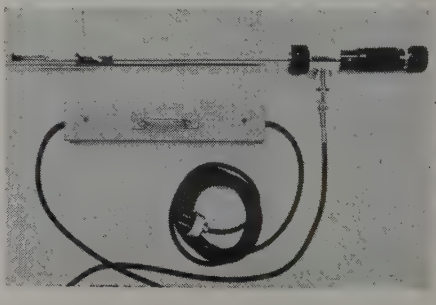
All of "nuclear controlled" nylon construction, the 12 tires comprising the new line range in size from 5.00-4 to 11.00-12. Reduced weight is pointed out as an important characteristic of the new tires, and it is reported that they have survived burst-tests at 3 times rated inflation.

Exceptional durability and heat resistance is reported for the compounds used in the tread stock.

## New Borescope Permits Complete Internal Inspection

A new borescope developed by Lenox Instrument Co. permits complete internal inspection of tanks, vessels, combustion chambers, etc.

It makes use of an adjustable mirror which is controlled by a hand-wheel. It gives a 10-power magnification, has a field of vision 9-inches in diameter at a distance of 24 inches, and has a viewing-head with a 100-watt lamp for illumination. Modifications to meet specific applications can be made.



## VIP Flight to D.C.

(*Continued from page* 36)

quire that all multi-engined aircraft, with the exception of light twins in VFR conditions, carry 2 pilots; V.I.P. aircraft often 3. The shortage of instrument-qualified pilots on the Mission, however, means that the Heron is flown on almost all V.I.P. trips by only one. During a night instrument approach to an unfamiliar control area this can result in the need to fly a holding pattern with one hand, write down clearance instructions with the other, read the clearance back, probably consult a Radio Facility Chart and re-tune Range and ILS Receivers. On these occasions the excellent R.A.F. Sgt., who rapidly learned how to tune the radio receivers, identify a station signal and find his way around all the publications, is strapped firmly in the co-pilot's seat and makes the whole performance possible.

"Flight planning to meet an ETA depends largely on accurate forecast winds (seldom provided) and an estimate of possible air traffic delays, which can never be more than an inspired guess. Take-off delays of up to 2 hrs. have been experienced, but a call to the Controller at Washington Center will sometimes help in selecting the altitude least in demand in order to speed up the clearance. Unhappily the Heron is seldom able to reach the less populated heights and the margin of 10 knots between normal and maximum continuous cruising does not allow for much time to be caught up en route. However, the ability to operate from 800-yard landing strips means that the aircraft is not confined to major airports and can often save passengers valuable time by taking them to a small field closer to their destination.

"This is the story of the Heron's first year. The number of hours flown may not in themselves seem impressive, but when considered against a background of unavoidable non-flying days between each leg of a V.I.P. journey, the need to conserve hours so that the next inspection will not interfere with the Ambassador's speaking tour, and the limitations of even an exceptional one-man maintenance crew, it can safely be said that few aircraft would have performed so well.

"The end product of all the paper work shows that the operating costs of about $9,000 were well within the year's budget, and that approximately $7,000 would have been spent on equivalent airline travel. Prospects for 1956 are good, and if computed at the rate for the latter half of 1955 this particular dollar gap should certainly be closed."

## Transocean Gets Babb Co. Inc.

Transocean Corp. of Calif. has acquired the Babb Co., Inc., from Atlas Corp., Babb's parent firm.

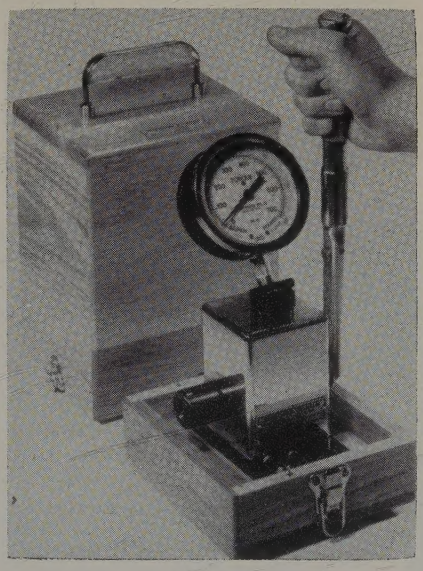
Babb has overhaul and maintenance facilities in various cities, and is a dealer in aircraft, engines, parts and equipment. Transocean is parent concern of about ten diversified aviation companies.

Babb itself will be merged with Transocean, as part of its operation.

## New Hydraulic Calibrator for Torque Wrench Testing Offered

Skidmore-Wilhelm Co. has announced availability of a new hydraulic calibrator, capable of testing torque wrenches to within 1% accuracy of full-scale readings.

The calibrator is a self-contained unit, needing no electrical outlets, air feeds, etc. The wrench is placed in a coupling, and turns it, creating a hydraulic pressure which is measured by a specially-calibrated gauge.



The unit comes in 3 sizes; the smallest has a range of 0-200 inch-ounces or inch-pounds; medium size registers 0-60 foot-pounds or 0-150 foot-pounds; largest measures from 0 to 600 foot-pounds or 0-2000 ft.-lbs.

## Aircraft Exhaust-Track Cleaner

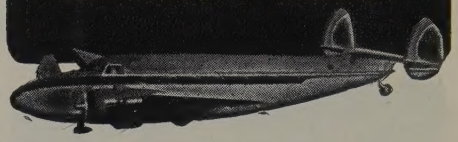
The Penetone Co., Tenafly, N.J., is marketing an exhaust-track cleaner which is known as Formula 831.

It has no toxic ingredients and can be applied in full strength or mixed with as much as 10 parts water.

It is claimed that Formula 831 will not attack aluminum alloys, stainless steel, magnesium, plexiglas or any fabrics. According to the co., it has wide application for all types of aircraft detergent cleaning, because of its safety features and detergent properties.

**Karnish Instrument Sales and Service, Inc.,** Lock Haven, Pa., has purchased the Instrument Div. of The Lackner Co., of Cincinnati. The manufacturing facilities have been moved to Lock Haven, where Karnish has begun making Rate of Climb, Airspeed and Cabin Air Pressure indicators. Karnish has been in the aircraft instrument overhaul line since 1947, but this is their first venture into actual manufacturing.


AUTOMATIC CABIN TEMPERATURE CONTROLS FOR BUSINESS AIRCRAFT



- Available for either cycling combustion heaters or proportioning exhaust and ram air.
- Maintain constant selected cabin temperature.
- Easily installed. No shielded wiring, vacuum tubes, or mercury thermometer.
- Widely used on DC-3's, Lodestars, Mallards, A-26's, PV's, B-23's, Aero Commanders, and other executive planes.

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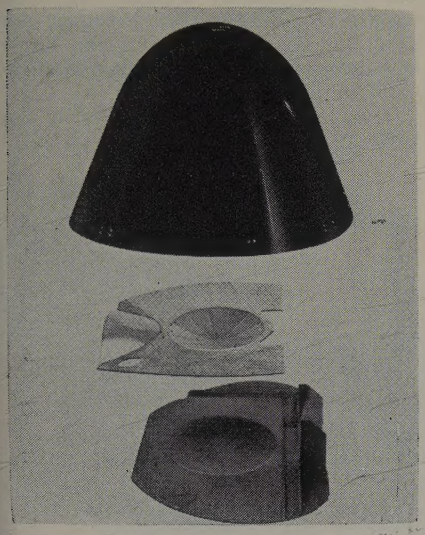
# NU-AVI-QUIP

## Radome & Microwave Absorber Kit Available from McMillan

A new line of Radome and Microwave Absorber Kits, for all-weather radar installations on commercial and business aircraft, has been announced by McMillan Industrial Corp., Ipswitch, Mass.

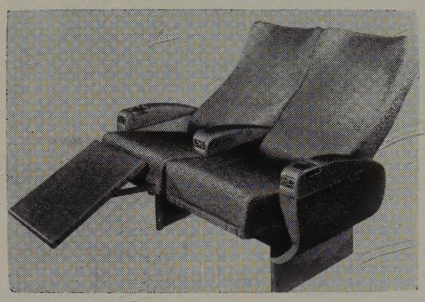
Kits consist of the radome, microwave absorber and attachment material. They are available for: DC-3; B-23; Vickers Viscount; Aero Commander and Super Ventura. Others will soon be available for C-46, Cessna 310 and all twin-Beechcraft.



The radomes and absorbers are designated for either X or C Band frequencies.

## New Drawer-Type Leg Rest

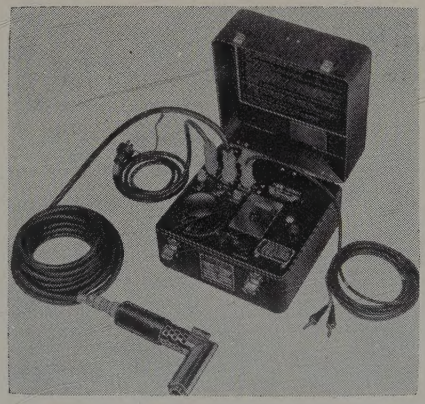
A leg-rest which slides into the bottom of the seat, out of sight, has been incorporated into Hardman luxury chairs. Seen in accompanying photo, the leg-rest is available in kit form for modification of all Hardman luxury seats, from Hardman Tool & Engineering Co., 1845 S. Bundy Dr., Los Angeles, Calif.



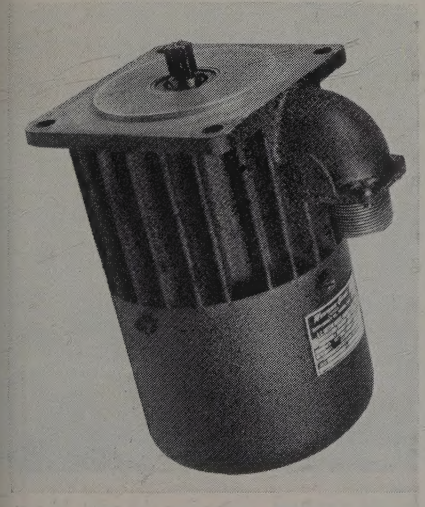
## "Tempcal" Tests Accuracy of Many Systems in Aircraft or in Prod.

The TEMPCAL Tester, mfg. by B&H Instrument Co., Inc., performs 5 basic functions, according to the company.

(1) Functionally tests aircraft fire-detection and wing anti-ice systems; (2) tests calibration and accuracy of thermal switches on aircraft; (3) bench-checks calibration and accuracy prior to installation, or while in production; (4) checks cylinder-head thermocouples and their circuits, and (5) functionally checks continuous wire systems.



Accuracy of the Tempcal Tester is guaranteed to plus-or-minus 5°F. in the 0°–800°F. range.



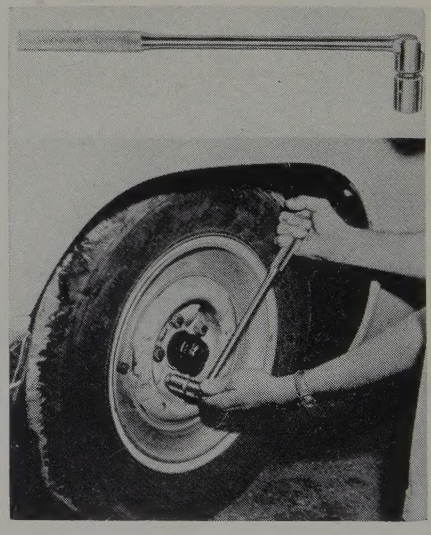
**MEASURING** *4½" x 7", this new 2.5 hp 400 cycle 200v 3-phase aircraft brake motor produced by Electro Prods. Div. of Western Gear Corp. weighs less than 10 lb., has a 5 hp peak. Rated speed is 11,000 rpm; starting torque is 715 oz. in. Identified as Model 1H42YK5B.*

## Dry Chemical Fire Extinguisher Is Offered by American LaFrance

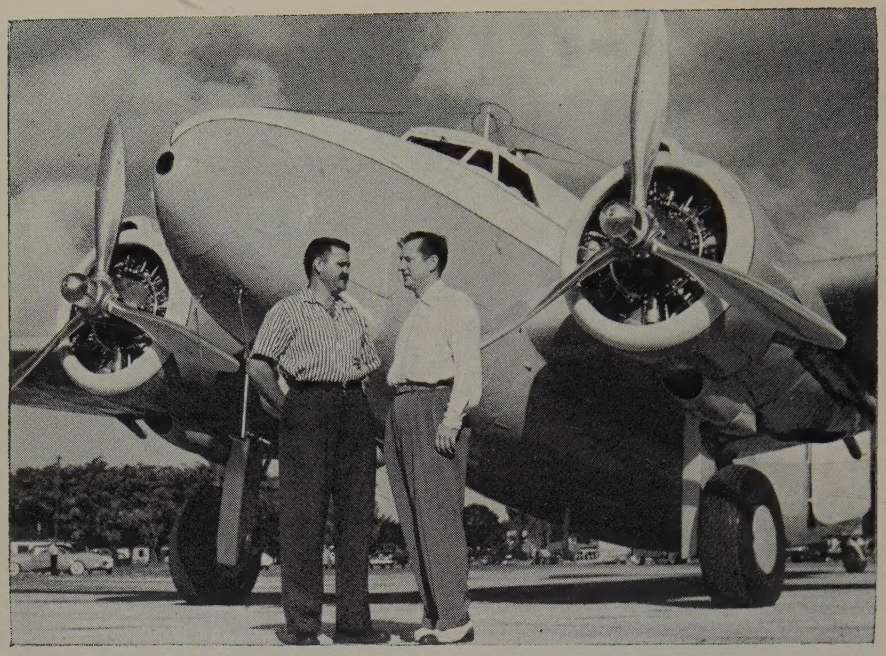
A new Dry Chemical Fire Extinguisher that weighs only 4 lbs. and is 14½-inches high, but packs the fire-killing power of four 1-qt. vaporizing liquid extinguishers is being produced by American LaFrance Corp.

The model, PDC-2A, features simple, hand-squeeze operation, and its contents are non-toxic, non-corrosive and will not freeze.

**FREE-WHEELING SOCKET WRENCH** *facilitates work in tight spots with its compact head and a ratchet arrangement that gives a new "bite" for every 12° rotation of the handle. Overall length of 16" gives greater leverage. The "Rotahead" is made of special alloy steel, and is constructed to meet military specifications for torque.*



Circle or check Oct. 2, 3, 4, for NBAA's Annual Forum in Denver.



**ONE EXECUTIVE PLANE SELLS ANOTHER.** *Mert Madden, of Madden & Playford, aircraft distributors at Miami International Airport, is shown with the company's new executive Lodestar, used for executive transportation and demonstration flights. Powered by Wright R1820-72 engines, the Lodestar cruises at 240 mph, will take the partners from Miami to St. Petersburgh or Havana in less than an hour. Harry Playford, World War I pilot, is widely known in aviation circles. Madden & Playford recently sold a similar Lodestar to Bacardi Rum Co., Havana. Below, Madden is shown with Jose Balboa, who with Edwardo Segrado flies the brightly-painted Bacardi plane. Interior features bar for product display; conversion by A & G Maintenance Miami. The Lodestar is used by company President Jose Bosh, one of the most prominent supporters of aviation in Cuba.*

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| *pre convention issue* | *convention issue* | *post convention issue* |
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## Emergency Evacuation Light

A new emergency evacuation light for aircraft, designed to comply with recent CAA regulations requiring emergency lighting, has been announced by Crown Lighting Corp.

The new unit is reported to feature a newly designed inertia switch which automatically turns on the light which it receives a deceleration impact of "sufficient magnitude and duration." (CAA recommends a deceleration of 1½G over a period of 1/30th sec. for operation of such devices.)

The unit measures 4″ x 5″ x 1½″, weighs 20 oz. with batteries, and is designed to mount inconspicuously flush with the interior of the cabin. Illumination is provided by 2 bulbs, wired in parallel for brightness; batteries are used, and the use of stacons and screw terminals rather than soldered connections facilitates maintenance.

The "Lifelite" is wired so that the batteries, bulbs and relay are all auto-

matically checked for operating order when the switch is placed on "Manual" and the light goes on. The inertia switch is automatically reset when the main switch is moved from "Manual" to "Automatic." Operation of the inertia switch is not affected by the mounting angle.

The manufacturer reports that the price of the Lifelite will be "substantially lower" than comparable emergency lights.

**EDGAR BERGEN,** *flying for the past 18 yrs., is accompanied by Charlie McCarthy and Mortimer Snerd in his new Piper Apache. The Apache, which Bergen will use for business purposes, was delivered by Baird Aviation Co., Lockheed Terminal, Burbank. Baird also sold 3 Apaches to North American Av. in 1956, and one more recently.*